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ABSTRACT

This report summarizes the results of the National Assessment of Educational Progress 1977-78 assessment of mathematics. Chapter one provides general information about mathematics assessments and includes discussion of the objectives, samples, exercises, statistics, and background variables of the assessment. Chapter two considers changes in performance between the first mathematics assessment conducted in 1972-73 and the second assessment being considered in this report. The third chapter describes performance for the nation and standard variable groups. Sections in this chapter include: region, sex, race/ethnicity, level of parental education, type of community, community size, and grade in school. Chapter four gives results for nonstandard variable groups. The two appendices discuss the estimation of standard errors and the source questions for special variables. (MK)

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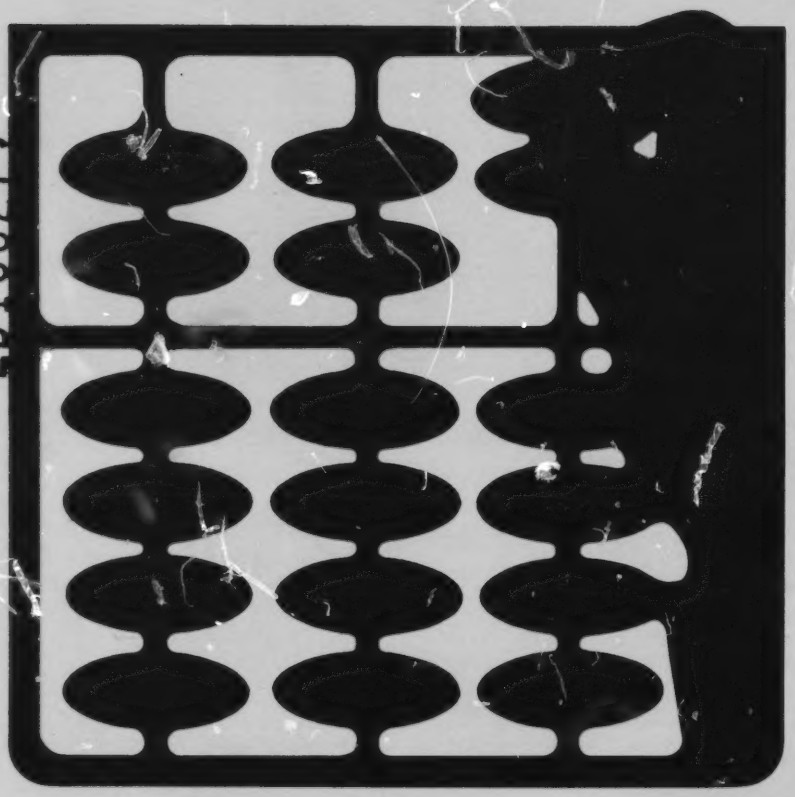

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SUMMARY VOLUME

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MATHEMATICS TECHNICAL REPORT:

SUMMARY VOLUME

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FOREWORD

When the U.S. Office of Education was chartered in 1867, one charge to its commissioners was to determine the nation's progress in education. The National Assessment of Educational Progress (NAEP) was initiated a century later to address, in a systematic way, that charge.

Each year since 1969, National Assessment has gathered information about the levels of education achievement across the country and reported its findings to the nation. NAEP surveys the education attainments of 9-year-olds, 13-year-olds, 17-year-olds and young adults, ages 26-35, in 10 learning areas: art, career and occupational development, citizenship, literature, mathematics, music, reading, science, social studies and writing. Different learning areas are assessed every year, and all areas are periodically reassessed in order to measure possible changes in education achievement. National Assessment has interviewed and tested more than 810,000 young Americans since 1969.

Learning-area assessments evolve from a consensus process. Each assessment is the product of several years of work by a great many educators, scholars and lay persons from all over the nation. Initially, these people design objectives for each subject area, proposing general goals they feel Americans should be achieving in the course of their education. After careful reviews, these objectives are given to exercise (item) writers, whose task it is to create measurement tools appropriate to the objectives.

When the exercises have passed extensive reviews by subject-matter specialists, measurement experts and lay persons, they are administered to probability samples. The people who compose these samples are chosen in such a way that the results of their assessment can be generalized to an entire national population. That is, on the basis of the performance of about 2,500 9-year-olds on a given exercise, we can make generalizations about the probable performance of all 9-year-olds in the nation.

After assessment data have been collected, scored and analyzed, National Assessment publishes reports to disseminate the results as widely as possible. Not all exercises are released for publication. Because NAEP will readminister some of the same exercises in the future to determine whether the performance level of Americans has increased, remained stable or decreased, it is essential that they not be released in order to preserve the integrity of the study.

ACKNOWLEDGMENTS

Many organizations and individuals have made substantial contributions to this report. Not the least of those to be gratefully acknowledged are the administrators, teachers and students who cooperated so generously during the collection of the data.

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Administration of the mathematics assessment was conducted by the Research Triangle Institute, Raleigh, North Carolina. Scoring and processing were carried out by the Measurement Research Center, Iowa City, Iowa, and by the National Assessment staff.

The actual preparation of this report was a collaborative effort of the National Assessment staff. Special thanks must go to the following people: Ingrid Larsson and Charlotte Overbury for data processing support; Ava Powell, Marci Reaser and Carmen Nietes for production; Barbara Ward for editorial supervision. This report was written by Donald Phillips.

Roy H. Forbes
Director

CHAPTER 1

INFORMATION ABOUT THE MATHEMATICS ASSESSMENTS

Introduction

The National Assessment of Educational Progress (NAEP) has completed two assessments of mathematics. The first was conducted during 1972-73, and the second, during 1977-78. This report summarizes the changes in mathematics performance from the first assessment to the second, and also summarizes the 1977-78 status of mathematics achievement measured by National Assessment's exercises.

To measure changes in performance from 1972-73 to 1977-78, approximately one-half of the exercises used in the first assessment were reassessed in the second. The status of mathematics achievement in 1977-78 was assessed by sets of exercises designed to measure National Assessment's 1977-78 mathematics objectives.

This chapter will present a brief discussion of the mathematics objectives, the samples and procedures for the 1972-73 and 1977-78 assessments, and the statistics and background variables used in this report. It will be followed by chapters that present and briefly discuss the mean changes in performance from 1972-73 to 1977-78, mean results for the 1977-78 assessment reported by standard National Assessment background variables and mean results for background variables specific to the 1977-78 mathematics assessment.

Objectives

The 1972-73 mathematics objectives were organized into a three-dimensional scheme. The dimensions were:

1. Uses of mathematics
2. Mathematical content
3. Cognitive abilities

The "uses of mathematics" dimension proved to be of little usefulness in writing exercises and was effectively abandoned as a functioning dimension of these objectives.

Within "mathematical content" there were 17 content categories:

1. Number and numeration concepts
2. Properties of numbers and operations
3. Arithmetic computations

4. Sets
5. Estimation and measurement
6. Exponents and logarithms
7. Algebraic expressions
8. Equations and inequalities
9. Functions
10. Probability and statistics
11. Geometry
12. Trigonometry
13. Mathematical proof
14. Logic
15. Miscellaneous topics
16. Business and consumer mathematics
17. Attitude and interest

The "cognitive abilities" dimension contained six categories:

1. To recall and/or recognize definitions, facts and symbols
2. To perform mathematical manipulations
3. To understand mathematical concepts and processes
4. To solve mathematical problems -- social, technical and academic
5. To use mathematics and mathematical reasoning to analyze problem situations, define problems, formulate hypotheses, make decisions and verify results
6. To appreciate and use mathematics

The "attitude and interest" objective of the content dimension was not measured at all during the 1972-73 assessment. Similarly, the "appreciation and use of mathematics" cognitive dimension was not addressed by the first assessment.

The objectives of the second assessment also employ a content dimension and a cognitive-process dimension. The content categories are:

1. Numbers and numeration
2. Variables and relationships
3. Shape, size and position
4. Measurement
5. Other topics

The cognitive-process categories are:

1. Mathematical knowledge
2. Mathematical skill
3. Mathematical understanding
4. Mathematical application

The objectives matrix for the 1977-78 assessment is essentially formed by collapsing and deleting categories from the mathematical content and cognitive abilities dimensions of the 1972-73 objectives. Attitudes toward mathematics became a separate component of the objectives for the second assessment of

mathematics and were not fitted into the above matrix.[1] Attitudes toward mathematics were assessed in the 1977-78 assessment, but they are not discussed in this report.

In addition to the objectives matrix, a set of questions to be addressed by the assessment was developed for the 1977-78 survey. It was intended that this set serve to help organize the reports of the second assessment. These questions are essentially organized along the lines of the cognitive-process dimension of the objectives, which are:

I. Mathematical knowledge

A. How well can students recall and recognize facts, definitions and symbols?

II. Mathematical skill

A. How well can students perform computations, including computations with whole numbers, integers, fractions, decimals, percents, ratios and proportions?

B. How well can students make measurements?

C. How well can students read graphs and tables?

D. How well can students perform geometric manipulations like constructions and spatial visualizations?

E. How well can students perform algebraic manipulations?

F. How well can students estimate the answers to computations and measurements?

III. Mathematical understanding

A. How well can students translate a verbal statement into symbols or a figure, and vice versa?

B. How well do students understand mathematical concepts and principles?

IV. Mathematical application

A. How well can students solve typical textbook problems?

---

[1]For a more complete discussion of the mathematics objectives, see Mathematics Objectives, Second Assessment (1978).

B. How well can students solve nonroutine problems?

C. How well can students estimate the answers to problems?

D. How well can students use mathematics in reasoning and making judgments?

National Assessment recognizes that the answers to all these questions cannot be supplied by the assessment. However, data can be provided that can give the reader some basis for formulating his or her own answers to these questions.

Reporting of both the changes in performance between the two assessments and the 1977-78 status results is organized by these questions. For the changes in performance, usually only the major headings were addressed. Some of the subtopics are not addressed in the status results because they were inadequately measured.

Sample

National Assessment uses a deeply stratified probability sample in which each individual is sampled with known probability.[2] The individual's performance is then weighted by the inverse of this known probability to give estimates of the national population at a particular age group who can perform particular tasks.

In 1977-78, the assessment sample included individuals enrolled in school who were aged 9, 13 and 17. In all, there was a total of more than 70,000 individuals included in the sample. There were 17,190 at age 9, 26,661 at age 13 and 26,756 at age 17 included in the 1977-78 sample. On the average, there were 2,456, 2,424 and 2,230 respondents for each exercise booklet at ages 9, 13 and 17, respectively.

The sample for the 1972-73 assessment was drawn in a similar way; however, there are some major differences. The first mathematics assessment included a sample of young adults aged 26-35 and a sample of 17-year-olds who were not enrolled in school. In the second mathematics assessment, both of these features proved to be beyond the resources available, so they were not included. Comparisons of 17-year-olds' performances are made only between the portions of the 1972-73 17-year-olds' sample who were enrolled in school during the assessment and the 1977-78 17-year-olds' sample.

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[2]For more detailed documentation, see Chromy et al. (1974). For an introductory treatment aimed at state and local assessment problems, see Jaeger (1973).

In the first assessment, exercise booklets were administered in two different ways. One or two exercise booklets at each of the ages (9, 13 and 17) were administered in an individual-interview mode; the remaining booklets at these ages were administered to groups of students. Usually there were 10 to 12 persons per group for the group administrations. The exercises given in the individual-interview mode in the first assessment were not reassessed in 1977-78 as change measures.

There were 68,010 persons in the portion of the 1972-73 sample to be used in computing changes in performance from the first to the second mathematics assessment. Of these, 18,638 were 9-year-olds, 23,507 were 13-year-olds and 25,865 were 17-year-olds. As mentioned earlier, all of these were enrolled in school at the time of the assessment, and only those persons involved in group administrations were included in the comparison sample. On the average, in the first assessment comparison sample there were approximately 2,660, 2,610 and 2,350 respondents per exercise booklet at ages 9, 13 and 17, respectively.

Exercises

National Assessment used both multiple-choice exercises and open-ended, free-response exercises in each mathematics assessment. In the 1977-78 assessment, there was almost an even number of exercises for each of these types. The majority of the exercises that were used for change measures were open-ended, free-response exercises.

The 1972-73 responses to exercises used as change measures were rescored at the same time as the 1977-78 responses to these exercises, using the same scoring guides. To insure that each scorer was assigning scores in the same way, quality control procedures were established that compared multiple readings of the same response. On the average, these scores agreed 98.9%, 98.5% and 97.7% of the time for ages 9, 13 and 17, respectively, across all open-ended, free-response exercises.

Statistics

National Assessment does not report scores for individuals but rather reports estimated percentages of the nation and some subgroups of the nation that can answer an exercise correctly. National Assessment also reports, for the nation and these subgroups, the mean percentage correct across sets of exercises. In addition to these estimates, standard errors are calculated for both exercise percent correct and mean percent correct. These standard errors are estimated using a jackknife procedure.[3]

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[3]See Appendix A.

In addition to percentages and mean percentages, many results for subgroups of the national population are expressed as percentage differences between the performance of the subgroups and the nation. These differences are reported both for exercises and for means across sets of exercises. As with the percentages correct, the variation due to sampling is estimated by jackknifed standard error estimates.

Measures of change are reported as the change in percentage correct or the change in difference from the nation on an exercise from 1972-73 to 1977-78 and as means of these changes in performance across sets of exercises. Standard error estimates for these measures of change are also estimated using the jackknife procedure.

This report presents (1) mean changes in performance from 1972-73 to 1977-78 and their associated standard errors and (2) means of 1977-78 performance and their associated standard errors. The sets of exercises across which the means are calculated are described along with the means.

It should be understood that all performance data in this report are mean percentages or mean percent differences from the nation. The words "mean" and "average" are used interchangeably. For consistency in reporting, National Assessment has arbitrarily adopted the significance level of $\alpha = .05$. Hence, National Assessment considers differences that are equal to or larger than twice their standard errors to be statistically significant. Throughout this report, unless otherwise stated, one can assume that statements about significance mean $\alpha = .05$.

Background Variables

In addition to reporting results for all age 9, age 13 and age 17 students in the United States, results are reported for a number of population subgroups. Definitions of several of these cut across all years of National Assessment's activities. Some of the population subgroups descrived are defined only for the 1977-78 mathematics assessment. Descriptions of the subgroups that are used for all years appear below; these are followed by descriptions of those that only apply to the 1977-78 mathematics assessment.

Sex

Results are reported for males and females.

Race/Ethnicity

Results are presented for blacks, whites and Hispanos. Only mean results are available for Hispanos in any National Assessment reports.

Region

The country has been divided into four regions: Northeast, Southeast, Central and West. States included in each region are shown on the following map.

Level of Parental Education

Three categories of parental-education levels are defined by National Assessment, based on students' reports. These categories are: those whose parents did not graduate from high school, those who have at least one parent who graduated from high school and those who have at least one parent who has had some post-high-school education.

Type of Community

Communities in this category are defined by an occupational profile of the area served by a school as well as by the size of the community in which the school is located.

Advantaged-urban communities. Students in this group attend schools in or around cities with a population greater than 200,000 where a relatively high proportion of the residents are in professional or managerial positions.

Disadvantaged-urban communities. Students in this group attend schools in or around cities with a population greater than 200,000 where a relatively high proportion of the residents are on welfare or are not regularly employed.

Extreme-rural communities. Students in this group attend schools in areas with a population under 10,000 where many of the residents are farmers or farm workers.

Size of Community

Big cities. Students in this group attend schools within the city limits of cities having a 1970 census population over 200,000.

Fringes around big cities. Students in this group attend schools within metropolitan areas (1970 U.S. Bureau of the Census urbanized areas) served by cities having a population greater than 200,000 but outside the city limits.

Medium cities. Students in this group attend schools in cities having a population between 25,000 and 200,000 not classified in the fringes-around-big-cities category.

Small places. Students in this group attend schools in communities having a population less than 25,000 not classified in the fringes-around-big-cities category.

Grade Level

Results are categorized by school grade for each of the ages, as shown below. Approximate percentages of respondents at each grade are also shown.

Age 9		Age 13		Age 17		
Grades 3 and 4		Grades 7 and 8		Grades 10, 11 and 12		
25%	72%	26%	71%	13%	75%	12%

The background variables described below apply only to the 1977-78 mathematics assessment. Some of these variables are not defined for all age levels; the ages for which each applies appear with the description of the variable. Some of these variables are defined using self-report information provided by the respondents.[4] The data for these variables appear in Chapter 4.

Sex by Race

Data are reported for black females, black males, white females and white males. Data for this variable are available only for age 9.

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[4]See Appendix B for a copy of the 13- and 17-year-olds' self-report background questions used for these variables.

Grade by Race/Ethnicity

Data are reported for grade 3 blacks, grade 3 Hispanos, grade 3 whites, grade 4 blacks, grade 4 Hispanos and grade 4 whites. Data on this variable are available only for age 9.

Race by Type of Community

Data are reported for blacks living in advantaged-urban, disadvantaged-urban and extreme-rural communities, and for whites living in advantaged-urban, disadvantaged-urban and extreme-rural communities. Data on this variable are available only for age 9.

Region by Race/Ethnicity

Data are reported for blacks living in the Northeastern, Central, Western and Southeastern regions; for Hispanos living in the Northeastern, Central, Western and Southeastern regions; and for whites living in the Northeastern, Central, Western and Southeastern regions. Data on this variable are available only for age 9.

Use Hand Calculator

Data are available for ages 13 and 17. Results are reported for the following groups of students: those who reported using a hand calculator more than once a week, those who reported using a hand calculator less than once a week, those who reported using a hand calculator once a month and those who reported having never used a hand calculator.

How Much TV Watched

This variable is only defined for age 17 respondents. Results are reported for the following groups of students: students who reported watching less than one hour of TV yesterday, students who reported watching from one to two hours of TV yesterday, students who reported watching three or four hours of TV yesterday and students who reported watching five or more hours of TV yesterday.

Level of Mathematics Course Work

This variable is defined only for age 17 respondents. Results are reported for the following groups of students: students who reported not having taken at least one-half year of a first year algebra course; students who reported having taken at least one-half year of a first year algebra course, but no mathematics course beyond Algebra I; students who reported having taken at least one-half year of a geometry course, but no mathematics course beyond Geometry; students who reported having taken at least one-half year of a second

year algebra course, but no mathematics course beyond Algebra II; and students who reported having taken at least one-half year of a second year algebra course and at least one-half year of a mathematics course beyond Algebra II.

Sex by Level of Mathematics Course Work

This variable is defined only for age 17 respondents. Results are reported for males and females at each level of mathematics course work described above.

Race by Level of Mathematics Course Work

This variable is defined only for age 17 respondents. Results are reported for blacks and whites at each level of mathematics course work described above.

CHAPTER 2

CHANGES IN PERFORMANCE BETWEEN THE FIRST AND SECOND MATHEMATICS ASSESSMENTS

In this chapter, mean changes in performance from 1972-73 to 1977-78 are presented and discussed. There are several means at each age to be examined. For each age, the mean change in performance across all the exercises assessed in both the 1972-73 and 1977-78 assessments is presented. Means are also presented at each age for exercise subsets that measure particular mathematics topics or levels of mathematical functioning (Table 1). The exercises classified as knowledge ask about mathematics facts, definitions or identification of symbols. The mathematical skill exercises usually require using a learned algorithm, as in computation with whole numbers. Computation exercises are a subset of mathematical skill exercises and include computation with whole numbers, fractions and decimals. Mathematical understanding exercises typically require the respondent to translate from one form to another (for example, from an English sentence to an algebraic expression or equation). Application exercises usually require the solution of a problem that is expressed as a word problem.

The sets of computation, reading graphs and tables, and algebraic manipulation exercises are all subsets of the mathematical skills exercises. Similarly, the consumer problems exercise set is a subset of the mathematical application exercise set.

Mean changes in performance from 1972-73 to 1977-78 are presented in Tables 2 through 4 for ages 9, 13 and 17, respectively. Brief discussions of these results follow. Unless otherwise stated, all changes discussed in this chapter are statistically significant at the .05 level.

Age 9

The mean national change in performance across all exercises at age 9 is not significant for $\alpha = .05$; however, if $\alpha = .06$, then the decline is statistically significant. For the two subgroups of exercises measuring mathematical knowledge and mathematical skills and the subset of computation exercises there were no significant changes in mean national performance (Table 2). However, for the exercises measuring mathematical applications, the decline of about 6% from 1972-73 to 1977-78 in average performance is statistically significant.

Among the four regions reported upon, the decline in the West is the only change in performance across all exercises that is statistically significant.

TABLE 1. Titles of Sets of Mathematics Exercises for Which Mean Changes in Performance From 1972-73 to 1977-78 Are Given

	Number of Exercises		
	Age 9	Age 13	Age 17
All change exercises		77	102
Mathematical knowledge	17	16	18
Mathematical skills	21	37	46
Computation	12	17	17
Read graphs and tables	--*	--	10
Algebraic manipulation	--	--	14
Mathematical understanding	--	12	13
Mathematical application	9	12	25
Consumer problems	--	--	14

**Not enough exercises were in this set at this age for a meaningful average.*

For the three sets of exercises measuring knowledge, skills and computation, the only significant changes are the increases in performance of Southeastern students and performance relative to the nation on skill and computation exercises and the increases in the Northeasterners' performance relative to the nation on knowledge exercises. On application exercises, only the Southeastern students did not undergo a significant decline in performance. There were no changes in regional mean performance relative to the nation on application exercises.

Both males and females declined significantly on mathematical application. No other significant changes in performance or performance relative to the nation were found for age 9 males and females.

Age 9 black respondents showed significant increases in performance and performance relative to the nation on the entire set of exercises and on the knowledge, skill and computation subsets of exercises. In addition, this group showed a significant increase in performance, relative to the nation, on mathematical application exercises. Age 9 white respondents showed significant declines in performance on the entire set of exercises and on the application subgroup of exercises. They also had a significant decline in performance relative to the nation on the computation subset of exercises. Nine-year-old Hispanic respondents' performance did not change significantly on any of the sets of mathematics exercises reported here.

National Assessment reports three classifications of parental education, based on students reports. They are: those who have not graduated from high school, those who have graduated from high school and those with post-high-school education. At age 9, a considerable proportion (about 36%) of the respondents

TABLE 2. Age 9 -- Mean Change in Performance From 1973-78

	All Exercises (55 Exercises)				Knowledge (17 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-1.27	0.66			-0.78	0.84		
Northeast	0.04	0.90	1.31	0.86	1.87	1.13	2.65*	1.10
Central	-1.23	1.26	0.04	1.04	0.36	1.54	1.14	1.27
West	-3.69*	1.46	-2.42	1.25	-3.39	2.02	-2.61	1.69
Southeast	0.37	1.21	1.64	1.13	-1.47	1.31	-0.69	1.28
Male	-1.18	0.72	0.09	0.28	-0.26	0.93	0.52	0.45
Female	-1.36	0.71	-0.09	0.28	-1.29	0.96	-0.51	0.45
White	-1.98*	0.69	-0.71	0.36	-1.45	0.90	-0.67	0.44
Hispanic	0.55	1.51	1.82	1.52	1.13	2.31	1.93	2.22
Black	2.89*	0.76	4.16*	0.89	3.39*	1.44	4.17*	1.50
Most high school	-1.68*	0.81	-0.41	0.47	-0.72	1.02	0.06	0.70
Graduated high school	-2.39*	0.84	-1.12	0.61	-2.08	1.22	-1.30	0.90
Not graduated high school	-2.34*	1.11	-1.07	1.02	-2.22	1.62	-1.44	1.[illegible]
Advantaged urban	-0.68	1.35	0.59	1.43	-1.60	1.71	-0.82	1.[illegible]
Disadvantaged urban	2.45	1.61	3.72*	1.67	2.69	2.62	3.47	2.61
Extreme rural	-1.87	1.82	-0.60	1.78	-1.62	2.11	-0.84	1.98
Fringes around big cities	-1.01	1.37	0.26	1.31	0.71	1.86	1.49	1.74
Big cities	-1.38	1.15	-0.11	1.01	-1.69	1.32	-0.91	1.26
Medium cities	-1.71	1.67	-0.44	1.73	-0.52	1.98	0.25	2.04
Small places	-1.08	1.11	0.19	0.87	-0.73	1.38	0.05	1.03
3rd grade	-0.41	0.91	0.86	0.68	-0.07	1.[illegible]	0.71	0.94
4th grade	-1.43	0.72	-0.16	0.34	-0.77	0.93	0.01	0.46

Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 2 *(Continued)*. Age 9 -- Mean Change in Performance From 1973-78

	Skills (21 Exercises)				Computation (12 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-0.39	0.65			-0.58	0.80		
Northeast	-0.34	0.92	0.05	0.90	-1.08	1.32	-0.50	1.17
Central	-1.07	1.32	-0.68	1.07	-1.56	1.69	-0.98	1.37
West	-2.24	1.55	-1.85	1.31	-1.80	1.58	-1.22	1.41
Southeast	2.59*	1.14	2.98*	1.09	-2.82*	1.33	3.40*	1.30
Male	-0.65	0.75	-0.26	0.31	-1.04	0.89	-0.46	0.42
Female	-0.13	0.71	0.26	0.33	-0.10	0.93	0.48	0.43
White	-1.00	0.69	-0.61	0.34	-1.54	0.85	-0.96*	0.39
Hispanic	1.46	1.70	1.85	1.68	2.54	2.34	3.12	2.31
Black	3.02	0.79	3.41*	0.88	4.41*	1.15	4.99*	1.15
Post high school	-1.38	0.93	-0.99	0.58	-2.15	1.11	-1.57*	0.70
Graduated high school	-0.50	0.89	-0.11	0.71	-0.08	1.03	0.50	0.84
Not graduated high school	-1.11	1.25	-0.72	1.17	-0.80	1.51	-0.22	1.43
Advantaged urban	1.12	1.66	1.51	1.61	1.72	2.21	2.30	2.07
Disadvantaged urban	0.86	1.24	1.25	1.32	2.14	1.97	2.72	1.98
Extreme rural	-1.87	2.01	-1.48	1.98	-3.22	2.24	-2.64	2.23
Fringes around big cities	-1.08	1.39	-0.69	1.26	-0.65	1.62	-0.07	1.45
Big cities	-1.14	1.30	-0.75	1.12	0.10	1.31	0.68	1.37
Medium cities	-1.35	1.64	-0.96	1.63	-2.58	1.83	-2.00	1.72
Small places	0.44	0.98	0.83	0.81	-0.54	1.21	0.04	0.99
3rd grade	0.45	0.83	0.84	0.76	0.69	0.95	1.27	0.91
4th grade	-0.59	0.79	-0.20	0.37	-0.82	0.98	-0.24	0.46

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 2 *(Continued).* Age 9 -- Mean Change in Performance From 1973-78

	Applications (9 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-5.90*	0.96		
Northeast	-5.26*	1.74	0.64	1.53
Central	-5.53*	1.75	0.37	1.47
West	-8.36*	1.78	-2.46	1.61
Southeast	-3.61	2.14	2.29	1.88
Male	-5.90*	1.14	0.00	0.59
Female	-5.90*	1.13	0.00	0.60
White	-6.92*	1.02	-1.02	0.52
Hispanic	-3.69	2.60	2.21	2.66
Black	0.19	1.54	6.09*	1.55
Post high school	-6.11*	1.31	-0.21	0.84
Graduated high school	-8.37*	1.42	-2.47*	1.[illegible]
Not graduated high school	-8.45*	1.89	-2.55	1.85
Advantaged urban	-5.97*	2.48	-0.07	2.48
Disadvantaged urban	2.40	2.91	8.30*	2.92
Extreme rural	-2.52	2.60	3.38	2.60
Fringes around big cities	-6.36*	2.07	-0.46	1.93
Big cities	-4.75*	1.84	1.15	1.74
Medium cities	-7.17*	2.59	-1.27	2.48
Small places	-5.62*	1.57	0.28	1.22
3rd grade	-3.74*	1.39	2.16	1.18
4th grade	-6.57*	1.03	-0.67	0.48

**Indicates mean percentages significantly different from the nation at the .05 level.*

was not able to supply us with enough information to classify them with respect to parent's education level; hence, a sizable portion at this age is classified as unknown.

Of the 9-year-olds who could be classified in a parental-education group, the post-high-school, graduated-high-school and not-graduated-high-school groups all showed significant declines for the means across all exercises and the mathematical application subgroup. The post-high-school and graduated-high-school groups had significant declines in performance relative to the nation on the computation and application exercise subsets, respectively.

The type-of-community variable includes three classifications -- advantaged-urban areas, disadvantaged-urban areas and extreme-rural areas. These type-of-community categories include less than half of the total set of respondents. The others are simply not reported for the purpose of this variable, which describes only extreme community types.

For the three type-of-community groups reported, only the disadvantaged-urban areas showed any significant increases. This group showed significant increases in performance relative to the nation for means across all exercises and for the application exercise subset. The advantaged-urban group declined significantly in its performance on the application exercises.

The four size-of-community groups all declined in mean performance for the set of mathematical application exercises. There were no other significant changes in performance or performance relative to the nation for these four groups.

Nearly all of the 9-year-old respondents were in either grade 3 or grade 4. Both grades 3 and 4 posted significant declines in performance for the set of application exercises. There were no other significant mean changes for grades 3 and 4.

Age 13

The mean performance of age 13 respondents as a whole declined significantly across all exercises and across subsets of mathematical skill, computation and application exercises (Table 3). There were no other significant mean changes for all 13-year-olds.

The West was the only region to show any significant change in either performance or performance relative to the nation. The West had a significant decline in performance on the set of mathematical application exercises.

Females' mean performance declined across all exercises and the sets of skill, computation and application exercises. Males' mean performance declined significantly on the sets of computation, understanding and application exercises. Neither males nor females showed any changes in performance relative to the nation.

TABLE 3. Age 13 -- Mean Change in Performance From 1972-77

	All Exercises (77 Exercises)				Knowledge (16 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-2.04*	0.98			-0.27	0.99		
Northeast	-1.60	1.84	0.44	1.58	-0.27	2.18	0.00	1.80
Central	-2.12	1.98	-0.08	1.60	0.72	2.00	0.99	1.61
West	-1.41	1.74	0.63	1.58	-1.56	1.59	-1.29	1.51
Southeast	-2.58	1.96	-0.54	1.83	0.49	1.76	0.76	1.71
Male	-1.79	0.97	0.25	0.30	0.57	1.02	0.84	0.43
Female	-2.31*	1.07	-0.27	0.31	-1.15	1.16	-0.88	0.45
White	-2.36*	0.84	-0.32	0.50	-0.47	0.90	-0.20	0.50
Hispanic	-2.98	1.50	-0.94	1.59	-2.74	2.29	-2.47	2.31
Black	0.57	1.19	2.61	1.35	2.38	1.78	2.65	1.81
Post high school	-2.54*	0.91	-0.50	0.50	-0.66	1.02	-0.39	0.67
Graduated high school	-2.56*	0.95	-0.52	0.56	-0.30	1.10	-0.03	0.71
Not graduated high school	-2.53*	1.07	-0.49	0.97	-1.62	1.13	-1.35	1.32
Advantaged urban	-4.23*	1.08	-2.19	1.30	-2.65	1.97	-2.38	1.98
Disadvantaged urban	1.97	2.67	4.01	2.66	4.96	3.34	5.23	3.28
Extreme rural	-4.80	2.65	-2.76	2.52	-4.77	3.06	-4.50	2.94
Fringes around big cities	-0.47	1.64	1.57	1.39	1.02	1.99	1.29	1.71
Big cities	-1.89	1.91	0.15	1.76	1.02	1.91	1.29	1.83
Medium cities	3.17	3.26	5.21	3.06	4.31	3.02	4.58	2.86
Small places	-3.37*	1.48	-1.33	1.16	-1.65	1.52	-1.38	1.16
7th grade	-0.77	1.12	1.27	0.77	0.02	1.37	0.29	1.01
8th grade	-2.40*	0.94	-0.36	0.36	-0.12	0.93	0.15	0.41

Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 3 *(Continued).* Age 13 -- Mean Change in Performance From 1972-77

	Skills (37 Exercises)				Computation (17 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-2.42*	1.11			-2.78*	1.18		
Northeast	-1.67	1.90	0.75	1.69	-1.82	1.89	0.96	1.73
Central	-3.17	2.15	-0.75	1.77	-3.92	2.23	-1.14	1.83
West	-0.42	2.21	2.00	1.93	-0.33	2.28	2.45	2.01
Southeast	-3.87	2.29	-1.45	2.09	-4.35	2.67	-1.57	2.38
Male	-2.01	1.16	0.41	0.39	-2.69*	1.24	0.09	0.40
Female	-2.82*	1.20	-0.40	0.39	-2.85*	1.25	-0.07	0.41
White	-2.87*	0.99	-0.45	0.54	-3.17*	1.02	-0.39	0.55
Hispanic	-2.44	1.99	-0.02	2.09	-4.04	2.39	-1.26	2.35
Black	0.71	1.38	3.13*	1.50	0.30	1.66	3.08	1.59
Post high school	-3.24*	1.08	-0.82	0.54	-3.77*	1.07	-0.99	0.59
Graduated high school	-3.01*	1.09	-0.59	0.67	-3.59*	1.20	-0.81	0.74
Not graduated high school	-2.77*	1.25	-0.35	1.01	-2.51	1.66	0.27	1.37
Advantaged urban	-5.29*	1.41	-2.87	1.59	-3.91*	1.66	-1.13	1.85
Disadvantaged urban	1.92	2.87	4.34	2.84	2.74	3.85	5.52	3.75
Extreme rural	-4.15	2.57	-1.73	2.51	-4.67	3.36	-1.89	3.20
Fringes around big cities	-0.61	1.93	1.81	1.60	-0.97	2.03	1.81	1.70
Big cities	-3.39	2.15	-0.97	1.95	-2.87	2.21	-0.09	2.04
Medium cities	4.13	3.73	6.55	3.49	2.69	4.00	5.47	3.72
Small places	-2.76*	1.59	-1.34	1.29	-4.31*	1.79	-1.53	1.35
7th grade	-0.35	1.23	2.07*	0.86	0.18	1.44	2.96*	0.96
8th grade	-3.11*	1.08	-0.69	0.44	-3.67*	1.11	-0.89	0.45

Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 3 *(Continued)*. Age 13 -- Mean Change in Performance From 1972-77

	Understanding (12 Exercises)				Applications (12 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-1.91	0.99			-3.39*	1.05		
Northeast	-1.22	1.65	0.69	1.51	-3.55	2.16	-0.16	1.86
Central	-2.52	2.28	-0.61	1.76	-2.30	2.26	1.09	1.77
West	-1.52	1.67	0.39	1.57	-4.17*	1.59	-0.78	1.54
Southeast	-1.89	2.01	0.02	1.86	-3.41	2.12	-0.02	1.96
Male	-2.25*	0.99	-0.34	0.44	-3.86*	1.07	-0.47	0.53
Female	-1.60	1.17	0.31	0.45	-2.96*	1.27	0.43	0.55
White	-2.34*	0.90	-0.43	0.52	-3.39*	0.94	0.00	0.52
Hispanic	-1.36	1.52	0.55	1.63	-6.62*	1.66	-3.23	1.92
Black	0.46	1.59	2.37	1.69	-2.23	1.24	1.16	1.41
Post high school	-2.20*	1.07	-0.29	0.71	-3.26*	1.11	0.13	0.68
Graduated high school	-2.57*	1.21	-0.66	0.89	-4.21*	1.21	-0.82	0.74
Not graduated high school	-2.24	1.52	-0.33	1.35	-3.34*	1.56	0.05	1.57
Advantaged urban	-1.36	1.59	0.55	1.65	-5.95*	1.64	-2.56	1.80
Disadvantaged urban	1.74	3.48	3.65	3.37	-1.70	2.84	1.69	2.71
Extreme rural	-4.52	3.30	-2.61	3.14	-7.14*	3.21	-3.75	2.95
Fringes around big cities	-0.42	1.43	1.49	1.41	-2.08	2.14	1.31	1.77
Big cities	-0.76	2.38	1.15	2.11	-2.37	2.31	1.02	2.08
Medium cities	3.51	3.40	5.42	3.22	-1.65	2.79	1.74	2.69
Small places	-3.94*	1.62	-2.03	1.30	-3.96*	1.53	-0.57	1.24
7th grade	-0.78	1.27	1.13	0.96	-3.12*	1.35	0.27	0.95
8th grade	-2.26*	1.03	-0.35	0.43	-3.47*	1.02	-0.08	0.42

**Indicates mean percentages significantly different from the nation at the .05 level.*

White 13-year-olds showed significant declines in performance across all exercises and the sets of skill, computation, understanding and application exercises; Hispanic 13-year-olds had a significant decline in performance on the set of application exercises; black 13-year-olds showed a significant increase in performance, relative to the nation, on the set of mathematical skill exercises. There were no other significant mean changes for these three groups.

Like 9-year-olds, some (15%) age 13 respondents were not classified in one of the three reported parental-education groups. For all three parental-education groups, significant declines in mean performance were found for all exercises and for the sets of skill, computation, understanding and application exercises, with the exception that changes for the not-graduated-high-school group were not significant for the computation or understanding sets. There were no significant changes in performance relative to the nation for these groups.

The advantaged-urban group's average performance declined significantly across all exercises and across the sets of skill, computation and application exercises. The only other significant average change for the type-of-community groups at age 13 was a decline for the extreme-rural group on the set of application exercises.

The only significant mean changes found for the size-of-community groups were for the small-places group. This group declined in performance for all the means reported here except for the set of mathematical knowledge exercises.

Nearly all age 13 respondents were in either grade 7 or 8. The eighth graders declined significantly in mean performance across all exercises and on sets of mathematical skills, computation, understanding and application exercises. The seventh graders increased significantly in mean performance relative to the nation on the sets of mathematical skill and computation exercises and declined significantly in mean performance for the set of application exercises.

Age 17

The mean performance of in-school 17-year-olds as a whole declined across all exercises and on sets of skill, computation, reading graphs and tables, algebraic manipulation, understanding, application and consumer problem exercises (Table 4). Only mathematical knowledge exercises showed no significant changes for 17-year-olds.

The Northeastern, Western and Southeastern regions declined significantly on most of the means reported. The exceptions were the sets of knowledge exercises for all regions and reading graphs and tables exercises for the Southeast. In addition, the average performance of the Central region declined significantly on the sets of computation and consumer problem exercises. The Central region's performance increased significantly relative to the nation on the sets of mathematical skill and reading graphs and tables exercises,

TABLE 4. Age 17 — Mean Change in Performance From 1973-78

	All Exercises (102 Exercises)				Knowledge (18 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-3.55*	0.65			-0.12	0.76		
Northeast	-3.21*	1.18	0.34	1.08	0.02	1.54	-0.10	1.33
Central	-1.68	1.31	1.87	1.01	1.74	1.44	1.62	1.13
West	-5.82*	1.31	-2.27	1.15	-2.07	1.31	-2.19	1.22
Southeast	-3.76*	1.23	-0.21	1.20	0.66	1.53	0.54	1.44
Male	-3.92*	0.70	-0.37	0.30	-0.25	0.82	-0.37	0.40
Female	-3.24*	0.73	0.31	0.30	0.43	0.86	0.31	0.37
White	-3.46*	0.57	0.09	0.35	0.45	0.65	0.33	0.39
Hispanic	-2.32*	1.05	1.23	1.13	-0.62	1.90	-0.74	1.93
Black	-2.62*	0.81	0.93	0.81	-0.38	1.50	-0.50	1.34
Post high school	-3.77*	0.62	-0.22	0.35	-0.48	0.74	-0.60	0.46
Graduated high school	-4.57*	0.57	-1.02*	0.42	-0.59	0.87	-0.71	0.57
Not graduated high school	-4.74*	0.85	-1.19	0.70	0.30	1.16	0.18	1.03
Advantaged urban	-2.24	1.30	1.31	1.29	0.72	1.17	0.60	1.28
Disadvantaged urban	-5.68*	1.92	-2.13	2.02	-3.63	2.54	-3.75	2.56
Extreme rural	-2.03	1.68	1.52	1.59	2.36	2.02	2.24	1.98
Fringes around big cities	-2.88*	1.42	0.67	1.30	0.54	1.49	0.42	1.29
Big cities	-1.65	1.91	1.90	1.66	-0.16	2.13	-0.28	1.79
Medium cities	-2.25	1.98	1.30	1.92	1.16	2.43	1.04	2.12
Small places	-4.22*	0.78	-0.67	0.70	0.53	0.80	0.41	0.78
10th grade	-2.11*	0.96	1.44	0.74	0.98	1.21	0.86	1.00
11th grade	-3.60*	0.64	-0.05	0.23	0.44	0.71	0.32	0.28
12th grade	-3.63*	0.92	-0.08	0.77	-1.40	1.41	-1.52	1.13

Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 4 *(Continued)*. Age 17 -- Mean Change in Performance From 1973-78

	Skills (46 Exercises)				Computation (17 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-4.56*	0.72			-4.59*	0.84		
Northeast	-4.47*	1.37	0.09	1.24	-3.33	1.85	1.26	1.58
Central	-2.29	1.41	2.27*	1.10	-3.26*	1.58	1.33	1.26
West	-6.51*	1.55	-1.95	1.33	-5.89*	1.69	-1.30	1.47
Southeast	-5.46*	1.30	-0.90	1.26	-6.27*	1.56	-1.68	1.52
Male	-4.78*	0.80	-0.22	0.40	-4.96*	0.91	-0.37	0.51
Female	-4.36*	0.82	0.20	0.38	-4.27*	1.04	0.32	0.48
White	-4.57*	0.65	-0.01	0.39	-4.62*	0.78	-0.03	0.45
Hispanic	-3.66*	1.44	0.90	1.50	-4.65*	2.29	-0.06	1.2.
Black	-3.05	1.02	1.51	0.99	-3.06	1.61	1.53	1.34
Post high school	-4.57*	0.74	-0.01	0.44	-4.93*	0.81	-0.34	0.57
Graduated high school	-5.56*	0.68	-1.00	0.50	-5.36*	0.97	-0.77	0.66
Not graduated high school	-6.35*	1.00	-1.79*	0.80	-6.63*	1.39	-2.04	1.15
Advantaged urban	-4.11*	1.51	0.45	1.50	-4.05*	1.58	0.54	1.60
Disadvantaged urban	-6.33*	2.04	-1.77	2.12	-5.43*	2.56	-0.84	2.62
Extreme rural	-2.31	1.78	2.25	1.69	-3.99	2.00	0.60	1.90
Fringes around big cities	-4.22*	1.62	0.34	1.48	-4.12*	1.80	0.47	1.67
Big cities	-2.59	2.02	1.97	1.78	-3.32	2.64	1.27	2.28
Medium cities	-2.52	2.48	2.04	2.38	-3.06	2.25	1.53	2.17
Small places	-5.28*	0.90	-0.72	0.79	-5.10*	1.12	-0.51	0.93
10th grade	-3.47*	1.24	1.09	0.99	-3.13	1.58	1.46	1.18
11th grade	-4.66*	0.70	-0.10	0.26	-4.74	0.85	-0.15	0.31
12th grade	-4.14*	1.12	0.42	0.95	-4.95*	1.37	-0.36	1.22

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 4 *(Continued).* Age 17 — Mean Change in Performance From 1973-78

	Read Graphs and Tables (10 Exercises)				Algebraic Manipulation (14 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-3.35*	0.89			-3.78*	0.95		
Northeast	-5.98*	2.05	-2.63	1.70	-3.25	1.91	0.53	1.70
Central	0.64	1.16	3.99*	1.13	-1.26	2.10	2.52	1.59
West	-6.14*	2.04	-2.79	1.71	-6.19*	1.70	-2.41	1.56
Southeast	-2.87	1.92	0.48	1.76	-4.74*	1.46	-0.96	1.48
Male	-4.33*	1.37	-0.98	0.85	-4.07*	1.22	-0.29	0.56
Female	-2.45*	1.06	0.90	0.82	-3.52*	0.97	0.26	0.52
White	-3.45*	0.89	-0.10	0.49	-3.75*	0.97	0.03	0.37
Hispanic	1.60	3.48	4.95	3.63	-4.95*	1.79	-1.17	2.04
Black	-0.05	2.08	3.30	1.94	-3.01*	1.12	0.77	1.16
Post high school	-2.43*	1.13	0.92	0.84	-4.57*	1.08	-0.79	0.52
Graduated high school	-5.99*	1.33	-2.64*	1.25	-3.93*	0.93	-0.15	0.[illegible]
Not graduated high school	-5.13*	2.16	-1.78	1.81	-3.99*	1.03	-0.21	0.9[illegible]
Advantaged urban	-1.14	2.16	2.21	2.22	-3.66	2.77	0.12	2.59
Disadvantaged urban	-5.75	3.48	-2.40	3.32	-6.93*	1.98	-3.15	2.16
Extreme rural	3.14	2.25	6.49*	2.26	-2.07	2.13	1.71	2.05
Fringes around big cities	-2.40	2.08	0.95	1.81	-3.58	2.25	0.20	1.95
Big cities	-0.82	2.31	2.53	2.16	-1.49	2.16	2.29	1.90
Medium cities	-1.63	3.32	1.72	3.07	-0.27	3.71	3.51	3.55
Small places	-4.37*	1.19	-1.02	1.01	-4.92*	1.07	-1.14	1.03
10th grade	-4.15	2.51	-0.80	2.28	-2.11	1.22	1.67	1.17
11th grade	-3.22*	0.85	0.13	0.58	-3.89*	1.01	-0.11	0.34
12th grade	-2.51	1.96	0.84	1.95	-2.90	1.92	0.88	1.59

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 4 *(Continued)*. Age 17 -- Mean Change in Performance From 1973-78

	Understanding (13 Exercises)				Applications (25 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-4.44*	0.86			-3.85*	0.65		
Northeast	-3.29*	1.44	1.15	1.34	-3.14*	1.13	0.71	1.04
Central	-2.40	1.69	2.04	1.32	-2.62	1.34	1.23	1.00
West	-8.93*	1.89	-4.49*	1.59	-5.61*	1.21	-1.76	1.10
Southeast	-3.17*	1.43	1.27	1.42	-4.09*	1.33	-0.24	1.26
Male	-4.63*	0.97	-0.19	0.50	-4.57*	0.76	-0.72	0.40
Female	-4.28*	1.00	0.16	0.50	-3.25*	0.73	0.60	0.39
White	-4.32*	0.84	0.12	0.40	-3.81*	0.59	0.04	0.35
Hispanic	-2.77	2.31	1.67	2.28	-0.82	1.12	3.03*	1.22
Black	-3.59*	1.27	0.85	1.33	-2.91*	0.75	0.94	0.80
Post high school	-4.58*	0.85	-0.14	0.60	-4.24*	0.74	-0.39	0.43
Graduated high school	-5.84*	1.03	-1.40	0.75	-4.89*	0.68	-1.04	0.57
Not graduated high school	-5.82*	1.49	-1.38	1.34	-4.83*	0.87	-0.98	0.76
Advantaged urban	-1.51	1.41	2.93*	1.46	-1.30	1.85	2.55	1.73
Disadvantaged urban	-8.57*	2.38	-4.13	2.51	-4.42*	1.89	-0.57	1.96
Extreme rural	-3.76	2.32	0.68	2.15	-3.74*	1.78	0.11	1.67
Fringes around big cities	-4.94*	1.87	-0.50	1.69	-1.80	1.42	2.05	1.30
Big cities	-1.07	2.28	3.37	2.06	-1.25	1.82	2.60	1.60
Medium cities	-2.40	1.65	2.04	1.72	-4.11*	1.57	-0.26	1.52
Small places	-5.10*	1.22	-0.66	0.95	-5.19*	0.85	-1.34	0.74
10th grade	-1.94	1.56	2.50	1.34	-1.89*	0.88	1.96*	0.77
11th grade	-4.59*	0.92	-0.15	0.32	-4.01*	0.66	-0.16	0.25
12th grade	-4.71*	1.22	-0.27	1.28	-3.75*	1.20	0.10	1.05

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 4 *(Continued).* Age 17 -- Mean Change in Performance From 1973-78

	Consumer Problems (14 Exercises)			
	Mean Change in Percent Correct	Standard Error	Mean Change in Difference From the Nation	Standard Error
Nation	-4.34*	0.74		
Northeast	-5.23*	1.53	-0.89	1.32
Central	-2.58*	1.07	1.76	0.98
West	-6.04	1.71	-1.70	1.42
Southeast	-3.65*	1.68	0.69	1.53
Male	-5.36*	1.04	-1.02	0.63
Female	-3.44*	0.88	0.90	0.62
White	-4.68*	0.71	-0.34	0.38
Hispanic	1.53	1.91	5.87*	1.98
Black	-0.56	1.52	3.78*	1.42
Post high school	-4.10*	0.94	0.24	0.63
Graduated high school	-6.13*	1.05	-1.79	0.95
Not graduated high school	-6.06*	1.48	-1.72	1.21
Advantaged urban	-2.63	1.53	1.71	1.62
Disadvantaged urban	-3.14	2.95	1.20	2.81
Extreme rural	-1.40	2.04	2.94	1.91
Fringes around big cities	-2.94	1.49	1.40	1.40
Big cities	-1.15	1.94	3.19	1.80
Medium cities	-3.75	2.73	0.59	2.58
Small places	-5.81*	1.10	-1.47	0.86
10th grade	-3.90*	1.76	0.44	1.68
11th grade	-4.30*	0.79	0.04	0.44
12th grade	-4.44*	1.49	-0.10	1.51

**Indicates mean percentages significantly different from the nation at the .05 level.*

while the West declined significantly in performance relative to the nation on the set of understanding exercises.

Both age 17 males and females declined significantly in performance across all sets of mathematics exercises. There were no significant changes in the relative performance of males and females on any of the sets of exercises.

White 17-year-olds declined significantly for all means reported except mathematical knowledge exercises. Black and Hispanic 17-year-olds also declined in mean performance on many reported means. The exceptions for blacks were the knowledge, computation, reading graphs and tables, and consumer problem exercise sets. Exceptions for Hispanos are the knowledge, reading graphs and tables, understanding, application and consumer problem sets of exercises. Hispanos showed significant increases in average performance relative to the nation on the application and consumer problem sets of exercises. Blacks showed a similar increase on consumer problem exercises.

All three parental-education groups declined significantly in mean performance across all exercises and all exercise subsets except knowledge. The graduated-from-high-school group also declined in performance relative to the nation across all exercises and on the set of reading charts and tables exercises. The not-graduated-high-school group had a decline relative to the nation on the set of mathematical skill exercises.

The disadvantaged-urban group declined in performance across all exercises and for the sets of skill, computation, algebraic manipulation, understanding and application exercises. The advantaged-urban group declined in performance on the sets of skill and computation exercises, but increased in performance relative to the nation on the set of understanding exercises. The extreme-rural group declined in performance on the set of application exercises and increased in performance relative to the nation on the set of reading graphs and tables exercises.

The small-places group declined significantly in performance on all means except the set of knowledge exercises. The urban-fringe group declined in performance across all exercises and sets of skill, computation and understanding exercises. There were no other changes in performance for any of the size-of-community groups except for a decline on application exercises by the medium-city group.

Tenth, 11th and 12th graders all declined in average performance across all exercises and the sets of skill, application and consumer problem exercises. Eleventh and 12th graders also declined on the sets of computation and understanding exercises. In addition, 11th graders declined on the sets of reading graphs and tables and algebraic manipulation exercises.

CHAPTER 3

PERFORMANCES FOR THE NATION AND STANDARD VARIABLE GROUPS ON THE 1977-78 MATHEMATICS ASSESSMENT

In this chapter, the 1977-78 mean mathematics performances are reported for 9-, 13- and 17-year-olds in school. Mean differences from the nation for the various subgroups are also included in the tables of means. Instead of the detailed discussions of significant changes for each subset of items that were presented in Chapter 2, this chapter will present the general patterns that emerge across the various sets of mathematics exercises. Some of the exceptions to these patterns will also be presented.

Table 5 presents the title of the sets of exercises for which means have been calculated and also gives the number of exercises in each set at each age. The numbers and numeration, geometry knowledge and measurement knowledge sets of exercises are subsets of the mathematical knowledge set. The place value, basic facts, ordering, and numbers and operation properties exercises are subsets of the set of number and numeration exercises. A similar organization scheme applies for the mathematical skill and mathematical application sets of exercises. No subsets are reported for the mathematical understanding exercises. For skills, there are six major subsets of exercises: computation, measurement skills, reading graphs and tables, geometric manipulation, algebraic manipulation and estimations. Computation, measurement skills and algebraic manipulation are divided into subsets. Mathematical application is subdivided into three major subsets of which only routine problems is further divided into subsets.

There were not enough items for means for some topics at some ages because the topics were not as appropriate at some ages as others. Notice also that no overall mean percentages are reported. It was felt that means for the four levels of cognitive process provided more useful information than would an overall mean.

The results for ages 9, 13 and 17 for the 1977-78 assessment are presented in Tables 6 through 8, respectively. The following discussion describes in general terms mean performance for the different variables for all three age levels.

Region

For all ages, the Northeastern and Central regions of the country were significantly above the nation in average performance on most sets of mathematics exercises. On no set were either of these two groups significantly below

TABLE 5. Titles of Sets of Mathematics Exercises

Title of Set of Mathematics Exercise	Number of Exercises in the Set		
	Age 9	Age 13	Age 17
Mathematical knowledge	161	147	140
Numbers and numeration	120	86	68
Place value	30	16	*
Basic facts	54	23	23
Ordering	15	15	11
Number and operation properties	16	18	18
Geometry knowledge	25	44	46
Measurement knowledge	16	17	17
Mathematical skills	137	272	273
Computation	48	129	127
Whole number computation	20	20	18
Computation with fractions	*	34	30
Computation with decimals	*	18	18
Computation with integers	*	22	21
Measurement skills	30	32	21
Making measurements	18	12	*
Finding perimeter area and volume	*	12	*
Reading graphs and tables	16	27	29
Geometric manipulation	15	19	15
Algebraic manipulation	19	43	59
Solving equations	10	13	16
Simplifying and factoring	*	*	11
Plotting points	*	15	*
Graphing equalities and inequalities	*	*	12
Estimation	*	22	22
Mathematical understanding	44	108	105
Mathematical application	44	106	136
Routine problems	33	85	114
One-step word problems	18	27	20
Multistep word problems	*	13	30
Graph and table problems	*	13	15
Geometric problems	*	13	18
Measurement problems	*	*	13
Nonroutine problems	*	*	10
Combination, statistics and probability problems	*	11	13

Not enough exercises were in this set at this age for a meaningful average.

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the nation in performance. The Southeastern students' performance was significantly below the national average on nearly all sets of exercises at all three ages. In addition, their performance was frequently significantly below

that of students of the other regions for ages 13 and 17. Westerners' performance, at ages 9 and 17, was frequently significantly below the average performance of the nation and below that of the Northeastern and Central students.

At age 13, Westerners' mean performance was significantly below the mean national performance only on the mathematical knowledge, geometry knowledge and measurement knowledge exercise sets. None of the other mean Western 13-year-olds' performances differed significantly from the national average. At age 17, none of the regions differed significantly from the nation in average performance for the whole number computation exercise set.

Sex

At age 9, females tended to outperform males on knowledge and skill sets of exercises, except for the measurement knowledge, measurement skill, making measurement and geometric manipulation exercise sets. On these sets of exercises and on the set of understanding exercises, males significantly outperformed females. On the mathematical application set of exercises, males' and females' average performance did not differ significantly. It should be noted that at age 9 differences in performance for males and females, although statistically significant, were often quite small (less than 2%) and may not be meaningful.

At age 13, females had a significantly higher performance level than males on the set of skill exercises, the computation, numbers and numeration, and the algebraic manipulation subsets of exercises. Males performed significantly higher than females on the set of understanding and the subsets of measurement knowledge, measurement skill, making measurement, geometric manipulation, estimation and most subsets of application exercises. Females had a significantly higher performance level than males on the following knowledge exercise subsets -- numbers and numeration, basic facts, and number and operation properties, and the sets of computation exercises.

At age 17, males' performance tended to be significantly higher than females' average performance on the majority of the sets of exercises. There are several exercise sets for which there are no significant differences between males' and females' performances. Females performed significantly superior to males on the sets of basic facts, whole number computation and decimal computation exercises.

Race/Ethnicity

For all ages, whites' performance was significantly higher than that of the nation and that of blacks and Hispanos on all exercise sets reported. At all ages, blacks' and Hispanos' mean performances were significantly below the national averages across all exercise sets. At age 9, Hispanos' mean performances were occasionally significantly higher than blacks' averages. At age 13, Hispanos' mean performances were often significantly above blacks' averages; at age 17, Hispanos' averages were usually higher than blacks' mean performances.

The size of the differences among whites', Hispanos' and blacks' average performance was larger for 17-year-olds than for 9- or 13-year-olds.

Level of Parental Education

Across all three ages and across all sets of exercises reported, the performance of the three parental-education groups relative to each other stayed constant. The post-high-school group had significantly higher performance than did the graduated-high-school and the not-graduated-high-school groups, and the graduated-high-school group performed significantly higher than did the not-graduated-high-school group. At all ages, the post-high-school group performed significantly higher than the national average, and the not-graduated-high-school group performed significantly lower than the nation on all sets of exercises. At age 9, the graduated-high-school group was generally not significantly different from the nation in average performance. However, at age 13 this group's performance was often significantly below that of the nation, and at age 17 their performance was usually significantly below the national average performance.

Type of Community

For all ages, the advantaged-urban group was significantly higher in average performance than the disadvantaged-urban group, extreme-rural group and the nation on all exercise sets. The disadvantaged-urban group was significantly lower than the nation in average performance on all exercise sets at all ages. The average performances of 9- and 13-year-olds living in extreme-rural areas were usually significantly below the average national performance. Seventeen-year-olds from the extreme-rural group tended not to be significantly different from the nation in average performance.

Community Size

The urban-fringe group consistently performed significantly above the national average at ages 9 and 13 across all exercise sets. At age 17, this group usually performed significantly higher than the national average. The big-city group's performance was significantly below that of the nation on nearly all the 9-year-olds' exercise sets and on many of the 13-year-olds' and 17-year-olds' exercise sets. The small-places group was significantly below the nation on very few exercise sets at age 9, but was below the nation on many of the exercise sets for 13- and 17-year-olds. At age 9, the medium-city group was not significantly different in performance from the nation on any of the exercise sets. However, at age 13 this group was significantly higher in performance than the nation on several exercise sets, and at age 17 the medium-city group's performance was significantly greater than the nation on many of the exercise sets.

Grade in School

As would be expected, 9-year-old 4th graders significantly outperformed 9-year-old 3rd graders on all exercise sets. Similarly at age 13, 8th graders significantly outperformed 7th graders, and 11th and 12th grade 17-year-olds significantly outperformed 10th grade 17-year-olds. On some exercise sets, the 12th graders significantly outperformed the 11th graders, especially in the subsets of algebraic manipulation and applications exercises.

TABLE 6. Age 9 -- Mean Performance Percentages
1978

Mathematical Knowledge (161 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	65.94	0.44		
Northeast	69.66	0.69	3.72*	0.66
Central	68.71	0.81	2.78*	0.67
West	63.27	1.07	-2.67*	0.90
Southeast	61.50	0.82	-4.44*	0.79
Male	65.24	0.45	-0.70*	0.17
Female	66.66	0.48	0.72*	0.18
White	68.38	0.46	2.44*	0.23
Hispanic	56.73	1.12	-9.21*	1.07
Black	54.92	0.79	-11.02*	0.83
Post High School	71.26	0.50	5.32*	0.34
Grad. High School	66.44	0.60	0.50	0.46
Not Grad. High School	57.23	0.85	-8.71*	0.73
Advantaged Urban	74.63	0.83	8.69*	0.88
Disadvantaged Urban	55.36	1.26	-10.58*	1.24
Extreme Rural	61.42	1.62	-4.52*	1.64
Fringes	70.24	0.90	4.30*	0.80
Big City	61.65	0.79	-4.28*	0.68
Medium City	67.10	1.44	1.16	1.44
Small Place	65.60	0.61	-0.34	0.55
3rd Grade	53.75	0.62	-12.19*	0.44
4th Grade	70.20	0.49	4.27*	0.25

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued)*. Age 9 -- Mean Performance Percentages
1978

	Numbers and Numeration (120 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	67.45	0.48		
Northeast	71.57	0.84	4.11*	0.78
Central	70.36	0.84	2.90*	0.71
West	64.45	1.17	-3.01*	0.99
Southeast	62.82	0.96	-4.63*	0.89
Male	66.33	0.50	-1.13*	0.19
Female	68.60	0.54	1.15*	0.20
White	70.15	0.50	2.69*	0.26
Hispanic	56.93	1.28	-10.52*	1.21
Black	55.41	0.95	-12.05*	0.95
Post High School	73.06	0.54	5.60*	0.39
Grad. High School	68.19	0.69	0.74	0.53
Not Grad. High School	57.77	1.03	-9.68*	0.87
Advantaged Urban	76.86	0.95	9.41*	1.00
Disadvantaged Urban	55.90	1.38	-11.55*	1.36
Extreme Rural	62.83	1.92	-4.62*	1.94
Fringes	71.88	1.00	4.43*	0.87
Big City	62.58	0.90	-4.87*	0.77
Medium City	69.02	1.64	1.56	1.65
Small Place	67.24	0.66	-0.22	0.60
3rd Grade	53.39	0.68	-14.07*	0.50
4th Grade	72.38	0.55	4.92*	0.28

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Place Value		(30 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	63.43	0.52		
Northeast	66.61	0.80	3.18*	0.79
Central	66.64	0.92	3.21*	0.77
West	60.71	1.36	-2.72*	1.13
Southeast	59.08	1.17	-4.35*	1.06
Male	63.03	0.55	-0.41	0.31
Female	63.85	0.66	0.42	0.31
White	66.39	0.51	2.96*	0.29
Hispanic	52.54	1.65	-10.89*	1.60
Black	50.19	0.78	-13.25*	0.81
Post High School	69.23	0.71	5.80*	0.50
Grad. High School	64.30	0.81	0.87	0.60
Not Grad. High School	54.06	1.05	-9.38*	1.00
Advantaged Urban	71.67	1.03	8.24*	1.06
Disadvantaged Urban	52.93	1.35	-10.50*	1.46
Extreme Rural	60.00	1.69	-3.43	1.75
Fringes	66.38	1.14	2.95*	0.96
Big City	59.48	1.00	-3.95*	0.85
Medium City	65.53	2.30	2.10	2.28
Small Place	63.39	0.64	-0.04	0.58
3rd Grade	52.78	0.79	-10.66*	0.59
4th Grade	67.17	0.60	3.74*	0.28

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Basic Facts		(54 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	76.90	0.59		
Northeast	80.79	1.26	3.90*	1.09
Central	80.02	0.94	3.12*	0.83
West	73.86	1.30	-3.04*	1.12
Southeast	72.17	1.13	-4.73*	1.04
Male	75.19	0.65	-1.70*	0.28
Female	78.65	0.66	1.75*	0.29
White	79.76	0.64	2.86*	0.28
Hispanic	65.48	1.44	-11.42*	1.42
Black	64.08	1.20	-12.82*	1.21
Post High School	82.68	0.67	5.78*	0.48
Grad. High School	77.51	0.85	0.62	0.62
Not Grad. High School	66.81	1.17	-10.09*	1.02
Advantaged Urban	87.97	1.14	11.08*	1.12
Disadvantaged Urban	64.06	1.83	-12.83*	1.80
Extreme Rural	71.20	2.47	-5.70*	2.48
Fringes	82.34	1.10	5.44*	0.94
Big City	71.25	1.04	-5.64*	0.96
Medium City	78.60	1.87	1.71	1.77
Small Place	76.44	0.79	-0.46	0.70
3rd Grade	59.70	0.88	-17.20*	0.70
4th Grade	82.96	0.71	6.06*	0.37

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Ordering		(15 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	66.19	0.33		
Northeast	67.85	0.42	1.66*	0.46
Central	67.95	0.44	1.76*	0.45
West	65.19	0.98	-1.00	0.77
Southeast	63.43	0.66	-2.75*	0.59
Male	65.95	0.44	-0.23	0.21
Female	66.41	0.36	0.22	0.22
White	67.54	0.35	1.35*	0.18
Hispanic	61.43	1.18	-4.75*	1.03
Black	60.03	0.76	-6.16*	0.72
Post High School	68.76	0.47	2.57*	0.31
Grad. High School	66.82	0.52	0.63	0.50
Not Grad. High School	62.14	1.18	-4.04*	1.04
Advantaged Urban	69.48	0.64	3.29*	0.66
Disadvantaged Urban	61.44	0.98	-4.74*	0.97
Extreme Rural	65.17	1.78	-1.02	1.62
Fringes	68.44	0.48	2.25*	0.47
Big City	63.37	0.55	-2.81*	0.50
Medium City	67.29	0.62	1.10	0.62
Small Place	66.16	0.51	-0.03	0.34
3rd Grade	60.42	0.54	-5.77*	0.39
4th Grade	68.26	0.38	2.07*	0.15

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

Number and Operation Properties (16 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	45.92	0.77		
Northeast	54.23	1.40	8.30*	1.24
Central	47.70	1.12	1.77	1.06
West	40.73	1.73	-5.19*	1.47
Southeast	40.88	1.72	-5.04*	1.51
Male	44.55	0.88	-1.37*	0.42
Female	47.30	0.87	1.38*	0.43
White	48.22	0.79	2.30*	0.38
Hispanic	36.61	2.44	-9.31*	2.24
Black	35.50	1.82	-10.43*	1.66
Post High School	52.53	0.91	6.60*	0.66
Grad. High School	46.78	1.06	0.86	0.75
Not Grad. High School	34.70	2.04	-11.22*	1.80
Advantaged Urban	56.31	2.12	10.39*	2.15
Disadvantaged Urban	32.53	2.72	-13.39*	2.56
Extreme Rural	41.40	2.80	-4.52	2.81
Fringes	51.34	1.70	5.41*	1.63
Big City	40.70	1.64	-5.22*	1.34
Medium City	45.92	2.05	0.00	2.18
Small Place	45.95	1.23	0.03	0.95
3rd Grade	29.01	0.92	-16.92*	0.84
4th Grade	51.75	0.83	5.83*	0.47

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(continued)*. Age 9 -- Mean Performance Percentages 1978

	Geometry Knowledge (25 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	58.74	0.49		
Northeast	60.69	0.62	1.95*	0.68
Central	61.42	1.12	2.68*	0.85
West	57.60	0.98	-1.14	0.87
Southeast	54.60	1.07	-4.14*	0.98
Male	59.05	0.58	0.32	0.27
Female	58.43	0.54	-0.31	0.27
White	60.49	0.56	1.75*	0.23
Hispanic	54.12	1.06	-4.62*	1.06
Black	50.08	1.02	-8.65*	1.02
Post High School	63.28	0.54	4.54*	0.34
Grad. High School	58.47	0.68	-0.26	0.48
Not Grad. High School	53.25	1.04	-5.49*	0.99
Advantaged Urban	65.85	0.98	7.11*	0.98
Disadvantaged Urban	49.66	1.30	-9.08*	1.24
Extreme Rural	55.29	1.20	-3.45*	1.26
Fringes	63.04	0.76	4.30*	0.76
Big City	55.53	0.91	-3.21*	0.74
Medium City	59.29	1.79	0.55	1.66
Small Place	58.06	0.72	-0.68	0.58
3rd Grade	52.74	0.73	-6.00*	0.56
4th Grade	60.82	0.53	2.08*	0.24

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages
1978

	Measurement Knowledge (16 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	65.82	0.48		
Northeast	69.38	1.12	3.56*	0.90
Central	67.76	0.77	1.94*	0.69
West	63.27	0.95	-2.55*	0.85
Southeast	62.38	0.78	-3.44*	0.75
Male	66.77	0.50	0.94*	0.26
Female	64.89	0.58	-0.93*	0.25
White	67.43	0.52	1.61*	0.23
Hispanic	59.30	1.39	-6.52*	1.80
Black	58.86	0.85	-6.97*	0.85
Post High School	70.21	0.62	4.38*	0.35
Grad. High School	65.69	0.68	-0.13	0.51
Not Grad. High School	59.41	1.32	-6.41*	1.25
Advantaged Urban	71.62	1.00	5.80*	1.04
Disadvantaged Urban	60.15	1.19	-5.67*	1.21
Extreme Rural	60.40	1.55	-5.42*	1.58
Fringes	69.17	1.20	3.35*	1.07
Big City	64.28	0.68	-1.55*	0.71
Medium City	64.90	1.12	-0.92	1.18
Small Place	65.10	0.83	-0.72	0.63
3rd Grade	58.04	0.68	-7.78*	0.52
4th Grade	68.59	0.52	2.77*	0.18

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Mathematical Skills (137 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	43.34	0.40		
Northeast	46.61	0.60	3.27*	0.60
Central	46.16	0.86	2.82*	0.66
West	40.88	0.86	-2.45*	0.75
Southeast	39.08	0.68	-4.25*	0.69
Male	43.14	0.37	-0.19	0.17
Female	43.54	0.49	0.20	0.17
White	45.64	0.45	2.31*	0.22
Hispanic	35.44	1.08	-7.89*	1.05
Black	32.55	0.49	-10.78*	0.60
Post High School	48.38	0.54	5.04*	0.33
Grad. High School	43.86	0.55	0.53	0.44
Not Grad. High School	35.66	0.64	-7.67*	0.62
Advantaged urban	52.26	0.93	8.93*	0.97
Disadvantaged urban	34.45	1.07	-8.88*	1.03
Extreme Rural	40.07	1.58	-3.27*	1.58
Fringes	46.94	0.73	3.60*	0.67
Big City	40.07	0.85	-3.26*	0.70
Medium City	43.46	1.21	0.13	1.24
Small Place	43.08	0.58	-0.26	0.48
3rd Grade	32.92	0.59	-10.42*	0.43
4th Grade	46.92	0.45	3.58*	0.22

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Computation		(48 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	35.44	0.42		
Northeast	39.37	0.83	3.93*	0.74
Central	37.10	0.83	1.66*	0.67
West	33.39	0.94	-2.05*	0.80
Southeast	31.57	0.62	-3.87*	0.66
Male	34.28	0.42	-1.16*	0.24
Female	36.63	0.54	1.19*	0.24
White	37.30	0.48	1.86*	0.21
Hispanic	29.32	1.19	-6.12*	1.16
Black	26.65	0.64	-8.79*	0.70
Post High School	40.17	0.60	4.73*	0.39
Grad. High School	36.02	0.64	0.58	0.50
Not Grad. High School	28.01	0.82	-7.43*	0.77
Advantaged Urban	44.70	1.18	9.26*	1.21
Disadvantaged Urban	27.32	1.13	-8.12*	1.11
Extreme Rural	32.58	1.51	-2.86	1.51
Fringes	39.13	0.96	3.69*	0.84
Big City	32.60	0.77	-2.84*	0.66
Medium City	35.09	1.13	-0.35	1.17
Small Place	34.99	0.60	-0.45	0.49
3rd Grade	23.05	0.58	-12.39*	0.50
4th Grade	39.65	0.51	4.21*	0.24

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Whole Number Computation (20 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	52.36	0.63		
Northeast	57.77	1.41	5.41*	1.20
Central	54.29	1.12	1.93*	0.94
West	50.38	1.50	-1.98	1.25
Southeast	46.66	0.98	-5.70*	1.05
Male	49.79	0.68	-2.57*	0.39
Female	54.99	0.81	2.63*	0.40
White	54.72	0.70	2.35*	0.31
Hispanic	46.52	2.08	-5.85*	2.01
Black	40.12	1.16	-12.24*	1.13
Post High School	58.54	1.04	6.17*	0.73
Grad. High School	53.12	0.96	0.76	0.84
Not Grad. High School	40.90	1.32	-11.47*	1.22
Advantaged Urban	64.01	1.38	11.65*	1.49
Disadvantaged Urban	39.70	1.84	-12.66*	1.78
Extreme Rural	49.06	2.40	-3.31	2.37
Fringes	57.34	1.64	4.97*	1.42
Big City	48.18	1.20	-4.18*	1.02
Medium City	53.30	1.81	0.94	1.80
Small Place	51.70	0.85	-0.66	0.74
3rd Grade	33.47	0.86	-18.90*	0.79
4th Grade	58.82	0.83	6.46*	0.42

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Measurement Skills (30 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	52.91	0.46		
Northeast	55.77	0.66	2.86*	0.65
Central	56.78	0.91	3.87*	0.72
West	49.93	0.90	-2.98*	0.80
Southeast	48.28	0.97	-4.63*	0.88
Male	53.94	0.40	1.03*	0.23
Female	51.88	0.61	-1.03*	0.23
White	55.40	0.55	2.49*	0.24
Hispanic	43.26	1.22	-9.65*	1.14
Black	41.60	0.60	-11.31*	0.77
Post High School	57.61	0.56	4.70*	0.42
Grad. High School	53.42	0.76	0.51	0.57
Not Grad. High School	47.08	1.04	-5.83*	1.00
Advantaged Urban	61.50	1.29	8.59*	1.29
Disadvantaged Urban	45.45	1.51	-7.46*	1.50
Extreme Rural	49.89	1.77	-3.02	1.75
Fringes	56.48	0.76	3.57*	0.72
Big City	50.05	1.11	-2.86*	0.96
Medium City	53.49	1.61	0.58	1.63
Small Place	52.45	0.70	-0.46	0.54
3rd Grade	44.20	0.69	-8.71*	0.49
4th Grade	56.00	0.50	3.09*	0.21

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages
1978

Making Measurements (18 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	63.59	0.51		
Northeast	66.07	0.84	2.48*	0.80
Central	68.18	0.89	4.59*	0.74
West	60.45	1.10	-3.14*	0.95
Southeast	58.53	1.29	-5.06*	1.15
Male	64.51	0.47	0.92*	0.30
Female	62.68	0.70	-0.91*	0.30
White	66.42	0.58	2.83*	0.26
Hispanic	53.50	1.40	-10.09*	1.29
Black	50.90	0.67	-12.69*	0.77
Post High School	68.10	0.56	4.51*	0.45
Grad. High School	64.13	0.84	0.54	0.62
Not Grad. High School	57.09	1.45	-6.50*	1.33
Advantaged Urban	71.67	1.05	8.08*	1.07
Disadvantaged Urban	55.60	1.73	-7.99*	1.73
Extreme Rural	61.09	1.89	-2.50	1.93
Fringes	66.87	0.91	3.28*	0.85
Big City	60.31	1.15	-3.28*	0.99
Medium City	64.34	2.01	0.75	1.93
Small Place	63.36	0.76	-0.23	0.60
3rd Grade	55.14	0.84	-8.45*	0.61
4th Grade	66.66	0.54	3.07*	0.24

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

Reading Graphs and Tables (16 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	58.91	0.72		
Northeast	61.86	1.33	2.94*	1.21
Central	63.63	1.64	4.72*	1.22
West	55.91	1.24	-3.01*	1.16
Southeast	53.26	1.42	-5.66*	1.39
Male	57.53	0.82	-1.39*	0.32
Female	60.34	0.74	1.43*	0.33
White	62.22	0.77	3.31*	0.39
Hispanic	47.54	1.82	-11.37*	1.86
Black	43.73	1.18	-15.18*	1.18
Post High School	66.01	0.86	7.10*	0.57
Grad. High School	59.25	1.01	0.33	0.82
Not Grad. High School	45.57	1.18	-13.34*	1.14
Advantaged Urban	68.14	1.62	9.23*	1.44
Disadvantaged Urban	44.68	1.81	-14.23*	1.68
Extreme Rural	53.38	2.66	-5.53*	2.66
Fringes	63.10	1.11	4.19*	0.99
Big City	53.52	1.50	-5.39*	1.17
Medium City	58.53	2.12	-0.38	2.14
Small Place	59.45	1.01	0.53	0.76
3rd Grade	46.65	1.37	-12.26*	1.00
4th Grade	63.07	0.74	4.51*	0.43

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Geometric Manipulation (15 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	44.44	0.47		
Northeast	45.94	0.82	1.50	0.77
Central	46.89	0.87	2.45*	0.68
West	43.75	0.96	-0.69	0.84
Southeast	40.52	0.85	-3.91*	0.79
Male	45.32	0.61	0.88*	0.33
Female	43.56	0.53	-0.88*	0.33
White	46.77	0.50	2.34*	0.25
Hispanic	37.10	0.96	-7.34*	0.99
Black	33.63	0.87	-10.81*	0.85
Post High School	48.58	0.80	4.14*	0.57
Grad. High School	44.27	0.64	-0.16	0.55
Not Grad. High School	37.83	0.87	-6.61*	0.93
Advantaged Urban	51.39	0.97	6.95*	0.98
Disadvantaged Urban	37.71	1.42	-6.73*	1.38
Extreme Rural	42.01	1.50	-2.42	1.48
Fringes	47.77	0.75	3.33*	0.67
Big City	41.18	0.85	-3.25*	0.77
Medium City	44.73	0.95	0.30	0.97
Small Place	44.20	0.68	-0.24	0.48
3rd Grade	38.98	0.64	-5.46*	0.52
4th Grade	46.43	0.54	1.99*	0.19

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Algebraic Manipulation (19 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	39.36	0.55		
Northeast	45.08	0.79	5.72*	0.81
Central	42.19	1.13	2.83*	0.89
West	34.68	1.04	-4.68*	0.93
Southeast	34.96	1.01	-4.40*	0.90
Male	38.72	0.53	-0.64	0.34
Female	40.00	0.75	0.64	0.35
White	41.76	0.59	2.40*	0.28
Hispanic	31.99	2.03	-7.37*	1.90
Black	27.57	0.70	-11.79*	0.73
Post High School	44.94	0.68	5.58*	0.48
Grad. High School	40.23	0.68	0.87	0.50
Not Grad. High School	31.05	1.07	-8.31*	0.94
Advantaged Urban	50.11	1.69	10.75*	1.78
Disadvantaged Urban	28.85	1.70	-10.51*	1.64
Extreme Rural	35.32	2.11	-4.04*	1.98
Fringes	43.18	1.05	3.82*	1.04
Big City	36.61	1.18	-2.75*	1.06
Medium City	40.21	1.78	0.85	1.81
Small Place	38.67	0.91	-0.69	0.68
3rd Grade	27.16	0.78	-12.20*	0.62
4th Grade	43.56	0.60	4.20*	0.33

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued).* Age 9 -- Mean Performance Percentages 1978

	Solving Equations (10 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	44.52	0.73		
Northeast	51.12	1.24	6.60*	1.16
Central	46.70	1.35	2.18	1.11
West	39.32	1.53	-5.20*	1.30
Southeast	40.54	1.28	-3.98*	1.18
Male	43.59	0.70	-0.93*	0.39
Female	45.45	0.94	0.93*	0.40
White	46.72	0.81	2.20*	0.32
Hispanic	36.06	2.40	-8.45*	2.19
Black	34.32	1.37	-10.20*	1.41
Post High School	49.42	0.86	4.90*	0.48
Grad. High School	46.31	0.93	1.79*	0.63
Not Grad. High School	35.27	1.25	-9.25*	1.04
Advantaged Urban	55.97	1.60	11.45*	1.76
Disadvantaged Urban	35.46	1.84	-9.06*	1.77
Extreme Rural	39.46	2.74	-5.06*	2.50
Fringes	48.81	1.40	4.30*	1.42
Big City	42.71	1.15	-1.81	1.12
Medium City	46.13	2.63	1.62	2.54
Small Place	43.09	1.21	-1.43	0.82
3rd Grade	30.66	1.18	-13.85*	0.90
4th Grade	49.30	0.76	4.78*	0.47

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued)*. Age 9 -- Mean Performance Percentages 1978

Mathematical Understanding (44 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	39.60	0.42		
Northeast	43.56	0.49	3.96*	0.54
Central	41.99	0.94	2.39*	0.71
West	36.03	0.81	-3.57*	0.73
Southeast	36.37	0.71	-3.23*	0.68
Male	40.14	0.44	0.54*	0.21
Female	39.07	0.50	-0.53*	0.21
White	41.86	0.48	2.26*	0.24
Hispanic	31.44	0.88	-8.16*	0.86
Black	29.31	0.67	-10.29*	0.70
Post High School	45.15	0.50	5.55*	0.39
Grad. High School	39.55	0.67	-0.05	0.53
Not Grad. High School	32.50	0.72	-7.10*	0.67
Advantaged Urban	49.47	1.58	9.87*	1.56
Disadvantaged Urban	31.58	1.23	-8.03*	1.23
Extreme Rural	33.95	1.61	-5.66*	1.53
Fringes	43.62	1.00	4.02*	0.95
Big City	37.15	1.01	-2.45*	0.91
Medium City	41.01	1.61	1.41	1.57
Small Place	38.44	0.62	-1.16*	0.53
3rd Grade	30.45	0.77	-9.15*	0.54
4th Grade	42.81	0.46	3.21*	0.24

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued)*. Age 9 -- Mean Performance Percentages 1978

Mathematical Applications (44 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	37.75	0.41		
Northeast	41.67	0.57	3.92*	0.55
Central	40.02	0.84	2.27*	0.66
West	35.16	0.87	-2.59*	0.76
Southeast	33.72	0.77	-4.03*	0.76
Male	37.93	0.44	0.18	0.21
Female	37.56	0.47	-0.18	0.21
White	40.10	0.44	2.35*	0.24
Hispanic	29.51	1.51	-8.23*	1.42
Black	27.08	0.59	-10.66*	0.62
Post High School	43.73	0.56	5.98*	0.39
Grad. High School	37.52	0.56	-0.23	0.41
Not Grad. High School	29.98	0.72	-7.77*	0.74
Advantaged Urban	47.11	0.99	9.36*	1.07
Disadvantaged Urban	30.04	1.19	-7.70*	1.15
Extreme Rural	33.53	1.17	-4.22*	1.24
Fringes	42.13	0.78	4.38*	0.75
Big City	35.03	0.92	-2.72*	0.81
Medium City	37.52	1.24	-0.22	1.29
Small Place	36.88	0.68	-0.87	0.54
3rd Grade	27.58	0.56	-10.17*	0.44
4th Grade	41.22	0.43	3.48*	0.20

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued)*. Age 9 -- Mean Performance Percentages 1978

	Routine Problems (33 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	36.66	0.47		
Northeast	40.98	0.79	4.32*	0.70
Central	39.24	0.92	2.58*	0.74
West	33.86	0.98	-2.81*	0.35
Southeast	32.08	0.89	-4.58*	0.37
Male	36.96	0.52	0.30	0.25
Female	36.36	0.54	-0.30	0.25
White	39.38	0.52	2.72*	0.27
Hispanic	27.84	1.54	-8.82*	1.49
Black	24.03	0.64	-12.63*	0.68
Post High School	43.57	0.63	6.90*	0.44
Grad. High School	36.66	0.70	-0.01	0.49
Not Grad. High School	27.79	0.85	-8.87*	0.88
Advantaged Urban	47.65	1.11	10.99*	1.18
Disadvantaged Urban	27.77	1.28	-8.89*	1.27
Extreme Rural	32.13	1.40	-4.53*	1.50
Fringes	41.53	0.98	4.87*	0.94
Big City	33.68	1.05	-2.98*	0.94
Medium City	35.97	1.48	-0.70	1.53
Small Place	35.77	0.77	-0.90	0.63
3rd Grade	24.97	0.63	-11.69*	0.53
4th Grade	40.64	0.51	3.98*	0.24

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 6 *(Continued)*. Age 9 -- Mean Performance Percentages 1978

	One-Step Word Problems (18 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	44.43	0.59		
Northeast	49.23	1.22	4.80*	1.02
Central	47.13	1.03	2.70*	0.87
West	41.65	1.15	-2.78*	1.02
Southeast	39.22	1.28	-5.21*	1.19
Male	44.29	0.70	-0.14	0.30
Female	44.57	0.63	0.14	0.32
White	47.41	0.68	2.98*	0.32
Hispanic	35.61	1.68	-8.82*	1.67
Black	30.10	0.96	-14.33*	0.96
Post High School	51.38	0.71	6.95*	0.50
Grad. High School	44.78	0.86	0.35	0.59
Not Grad. School	33.47	1.10	-10.96*	1.04
Advantaged Urban	56.93	1.40	12.50*	1.44
Disadvantaged Urban	33.47	1.68	-10.96*	1.62
Extreme Rural	38.69	1.78	-5.74*	1.91
Fringes	49.83	1.24	5.40*	1.15
Big City	40.98	1.20	-3.45*	1.11
Medium City	43.36	1.58	-1.07	1.60
Small Place	43.60	0.96	-0.83	0.73
3rd Grade	30.98	0.81	-13.45*	0.68
4th Grade	49.05	0.60	4.62*	0.26

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7. Age 13 -- Mean Performance Percentages
1977

	Mathematical Knowledge (147 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	66.87	0.52		
Northeast	70.40	0.86	3.53*	0.78
Central	69.47	1.02	2.60*	0.82
West	65.01	1.02	-1.87*	0.90
Southeast	61.87	1.19	-5.00*	1.08
Male	66.96	0.53	0.09	0.19
Female	66.79	0.58	-0.08	0.20
White	69.74	0.45	2.86*	0.25
Hispanic	55.96	0.64	-10.92*	0.75
Black	52.82	0.72	-14.05*	0.86
Post High School	72.76	0.49	5.89*	0.28
Grad. High School	66.26	0.55	-0.61	0.36
Not Grad. High School	59.37	0.63	-7.50*	0.59
Advantaged Urban	74.16	0.66	7.29*	0.74
Disadvantaged Urban	56.58	1.66	-10.29*	1.64
Extreme Rural	62.50	2.00	-4.37*	1.93
Fringes	70.44	0.84	3.56*	0.71
Big City	64.35	1.12	-2.53*	1.03
Medium City	70.74	1.91	3.87*	1.89
Small Place	65.67	0.84	-1.20	0.69
7th Grade	58.10	0.65	-8.77*	0.41
8th Grade	70.75	0.48	3.87*	0.19

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Numbers and Numeration (86 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	71.20	0.54		
Northeast	74.59	0.82	3.39*	0.77
Central	73.85	0.90	2.65*	0.78
West	69.57	1.16	-1.63	1.00
Southeast	65.96	1.33	-5.24*	1.17
Male	70.63	0.57	-0.57*	0.21
Female	71.79	0.59	0.59*	0.21
White	74.11	0.47	2.91*	0.26
Hispanic	59.98	0.73	-11.22*	0.80
Black	56.75	0.75	-14.45*	0.86
Post High School	77.01	0.55	5.81*	0.33
Grad. High School	70.86	0.55	-0.34	0.39
Not Grad. High School	63.77	0.69	-7.42*	0.62
Advantaged Urban	78.65	0.72	7.46*	0.84
Disadvantaged Urban	60.44	1.81	-10.75*	1.79
Extreme Rural	66.55	1.84	-4.65*	1.77
Fringes	75.36	0.94	4.16*	0.78
Big City	68.06	1.12	-3.14*	1.06
Medium City	75.49	1.85	4.29*	1.85
Small Place	69.95	0.90	-1.25	0.74
7th Grade	61.84	0.67	-9.36*	0.44
8th Grade	75.36	0.51	4.16*	0.23

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Place Value		(16 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	70.86	0.84		
Northeast	74.50	1.40	3.64*	1.29
Central	75.50	1.25	4.64*	1.15
West	68.99	2.02	-1.87	1.68
Southeast	63.28	2.05	-7.58*	1.80
Male	71.03	0.94	0.18	0.42
Female	70.68	0.95	-0.18	0.44
White	75.13	0.69	4.27*	0.43
Hispanic	52.36	2.28	-18.50*	2.06
Black	50.86	1.34	-20.00*	1.43
Post High School	78.72	0.77	7.86*	0.46
Grad. High School	70.75	0.93	-0.11	0.54
Not Grad. High School	60.04	1.26	-10.82*	1.03
Advantaged Urban	79.46	1.35	8.61*	1.52
Disadvantaged Urban	55.31	2.02	-14.95*	1.96
Extreme Rural	62.69	3.21	-8.17*	2.94
Fringes	75.66	1.09	4.80*	0.96
Big City	66.98	1.53	-3.88*	1.41
Medium City	77.68	3.04	6.82*	3.06
Small Place	69.11	1.32	-1.75	0.99
7th Grade	59.24	1.07	-11.62*	0.75
8th Grade	76.10	0.89	5.24*	0.39

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Basic Facts		(23 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	90.80	0.47		
Northeast	92.66	0.78	1.86*	0.70
Central	92.76	0.86	1.96*	0.71
West	89.97	0.62	-0.84	0.65
Southeast	87.17	1.34	-3.63*	1.14
Male	89.77	0.55	-1.03*	0.24
Female	91.88	0.50	1.08*	0.24
White	92.81	0.40	2.01*	0.25
Hispanic	83.61	1.40	-7.19*	1.41
Black	80.60	1.56	-10.20*	1.43
Post High School	94.09	0.40	3.29*	0.33
Grad. High School	91.28	0.55	0.47	0.37
Not Grad. High School	86.66	0.77	-4.14*	0.74
Advantaged Urban	95.00	0.54	4.20*	0.65
Disadvantaged Urban	82.47	1.66	-8.33*	1.69
Extreme Rural	88.50	1.84	-2.30	1.76
Fringes	93.59	0.96	2.79*	0.82
Big City	88.01	1.00	-2.80*	0.92
Medium City	93.57	1.31	2.76*	1.32
Small Place	90.29	0.73	-0.52	0.61
7th Grade	84.97	0.68	-5.83*	0.44
8th Grade	93.42	0.42	2.62*	0.22

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Ordering		(15 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	54.04	0.62		
Northeast	57.42	0.73	3.38*	0.83
Central	56.64	1.45	2.60*	1.12
West	52.88	1.32	-1.16	1.12
Southeast	48.41	1.13	-5.63*	1.08
Male	54.94	0.69	0.91*	0.32
Female	53.15	0.72	-0.89*	0.32
White	56.46	0.66	2.42*	0.26
Hispanic	46.74	1.06	-7.30*	1.11
Black	40.72	0.67	-13.32*	0.91
Post High School	59.62	0.87	5.59*	0.54
Grad. High School	53.07	0.74	-0.97	0.59
Not Grad. High School	48.02	0.93	-6.02*	0.78
Advantaged Urban	59.17	1.45	5.13*	1.43
Disadvantaged Urban	44.32	2.26	-9.72*	2.18
Extreme Rural	49.57	1.92	-4.47*	1.83
Fringes	57.95	1.30	3.91*	1.07
Big City	50.09	1.04	-3.95*	1.02
Medium City	59.06	2.40	5.02*	2.32
Small Place	53.22	0.93	-0.82	0.81
7th Grade	45.41	0.79	-8.63*	0.53
8th Grade	57.76	0.63	3.72*	0.23

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Number and Operation Properties (18 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	63.26	0.69		
Northeast	66.62	1.24	3.37*	1.08
Central	65.47	0.79	2.21*	0.85
West	61.36	1.65	-1.89	1.38
Southeast	58.90	1.74	-4.35*	1.49
Male	62.28	0.74	-0.98*	0.37
Female	64.28	0.83	1.02*	0.39
White	66.07	0.64	2.81*	0.34
Hispanic	52.04	1.82	-11.21*	1.77
Black	49.22	1.08	-14.03*	1.09
Post High School	69.16	0.77	5.90*	0.55
Grad. High School	62.73	0.82	-0.52	0.63
Not Grad. High School	55.12	1.26	-8.14*	1.05
Advantaged Urban	72.69	1.51	9.43*	1.56
Dusadvantaged Urban	54.21	2.86	-9.04*	2.85
Extreme Rural	58.03	1.70	-5.22*	1.68
Fringes	68.03	1.51	4.78*	1.36
Big City	61.45	1.51	-1.81	1.40
Medium City	67.25	1.40	3.99*	1.52
Small Place	61.19	1.18	-2.06*	0.90
7th Grade	53.25	1.01	-10.00*	0.78
8th Grade	67.74	0.72	4.49*	0.38

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Geometry Knowledge (44 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	57.30	0.58		
Northeast	60.29	1.15	2.99*	1.00
Central	59.78	1.25	2.48*	0.98
West	55.28	0.90	-2.02*	0.88
Southeast	53.36	1.34	-3.94*	1.21
Male	57.45	0.59	0.15	0.26
Female	57.14	0.69	-0.16	0.26
White	59.83	0.54	2.53*	0.27
Hispanic	48.16	1.00	-9.14*	1.06
Black	44.87	0.86	-12.43*	0.95
Post High School	63.02	0.53	5.72*	0.29
Grad. High School	56.39	0.72	-0.91*	0.37
Not Grad. High School	49.78	0.78	-7.52*	0.75
Advantaged Urban	64.66	0.90	7.36*	0.90
Disadvantaged Urban	48.28	1.33	-9.02*	1.34
Extreme Rural	52.84	2.23	-4.46*	2.22
Fringes	59.89	0.92	2.59*	0.79
Big City	56.06	1.21	-1.24	1.02
Medium City	61.12	1.91	3.82*	1.87
Small Place	55.88	0.81	-1.42*	0.65
7th Grade	49.73	0.67	-7.57*	0.48
8th Grade	60.59	0.61	3.29*	0.21

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Measurement Knowledge (17 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	69.79	0.71		
Northeast	75.40	1.20	5.61*	1.11
Central	72.43	1.39	2.64*	1.12
West	67.10	1.48	-2.69*	1.28
Southeast	63.26	1.39	-6.53*	1.31
Male	73.02	0.76	3.23*	0.33
Female	66.30	0.82	-3.28*	0.33
White	73.26	0.66	3.47*	0.36
Hispanic	55.81	2.13	-13.98*	2.14
Black	53.57	1.53	-16.22*	1.55
Post High School	76.53	0.77	6.74*	0.46
Grad. High School	68.58	0.88	-1.20	0.63
Not Grad. High School	61.94	1.20	-7.85*	1.04
Advantaged Urban	76.02	1.27	6.24*	1.07
Disadvantaged Urban	58.55	2.67	-11.24*	2.61
Extreme Rural	67.06	3.00	-2.72	2.87
Fringes	72.87	1.25	3.08*	1.09
Big City	66.99	1.65	-2.79*	1.44
Medium City	71.62	2.97	1.83	2.90
Small Place	69.38	1.14	-0.40	0.90
7th Grade	60.84	1.04	-8.95*	0.69
8th Grade	73.71	0.64	3.92*	0.24

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued)*. Age 13 -- Mean Performance Percentages 1977

Mathematical Skills (272 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	51.88	0.65		
Northeast	56.85	0.98	4.97*	0.90
Central	54.46	1.18	2.58*	0.99
West	50.09	1.33	-1.79	1.15
Southeast	45.34	1.53	-6.54*	1.36
Male	51.33	0.68	-0.55*	0.18
Female	52.44	0.66	0.56*	0.18
White	55.20	0.54	3.32*	0.31
Hispanic	39.92	0.85	-11.96*	0.81
Black	35.10	0.81	-16.78*	0.91
Post High School	58.77	0.64	6.89*	0.31
Grad. High School	50.99	0.61	-0.89*	0.42
Not Grad. High School	42.96	0.66	-8.92*	0.61
Advantaged Urban	60.86	1.05	8.97*	1.06
Disadvantaged Urban	39.07	1.72	-12.82*	1.66
Extreme Rural	47.16	2.21	-4.73*	2.12
Fringes	56.66	1.06	4.78*	0.87
Big City	48.82	1.42	-3.06*	1.23
Medium City	57.07	2.59	5.19*	2.53
Small Place	50.06	0.97	-1.82*	0.88
7th Grade	40.23	0.66	-11.65*	0.46
8th Grade	56.92	0.64	5.04*	0.24

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Computation (129 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	51.68	0.74		
Northeast	57.91	0.95	6.23*	0.94
Central	53.72	1.32	2.04	1.12
West	49.64	1.62	-2.04	1.38
Southeast	44.79	1.75	-6.89*	1.55
Male	49.94	0.78	-1.74*	0.24
Female	53.44	0.77	1.76*	0.23
White	54.97	0.63	3.29*	0.31
Hispanic	39.13	1.14	-12.55*	0.99
Black	35.26	0.94	-16.42*	0.98
Post High School	58.96	0.76	7.28*	0.33
Grad. High School	50.73	0.64	-0.95	0.48
Not Grad. High School	42.42	0.79	-9.26*	0.71
Advantaged Urban	61.29	1.38	9.61*	1.33
Disadvantaged Urban	38.89	1.91	-12.79*	1.82
Extreme Rural	46.73	2.65	-4.95	2.53
Fringes	57.20	1.28	5.52*	1.05
Big City	48.91	1.64	-2.77*	1.38
Medium City	56.96	3.03	5.28	2.97
Small Place	49.30	1.04	-2.38*	0.98
7th Grade	37.12	0.71	-14.56*	0.53
8th Grade	57.31	0.76	6.13*	0.29

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

Whole Number Computation (20 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	82.67	0.49		
Northeast	85.52	0.69	2.85*	0.67
Central	84.65	1.03	1.97*	0.82
West	82.10	0.86	-0.57	0.78
Southeast	77.81	1.25	-4.87*	1.11
Male	81.04	0.38	-1.63*	0.22
Female	84.33	0.49	1.66*	0.23
White	85.06	0.42	2.39*	0.27
Hispanic	76.39	1.05	-6.28*	1.04
Black	69.49	1.10	-13.18*	1.10
Post High School	86.64	0.43	3.97*	0.28
Grad. High School	82.68	0.62	0.01	0.46
Not Grad. High School	77.33	1.02	-5.34*	0.99
Advantaged Urban	86.63	0.47	3.96*	0.61
Disadvantaged Urban	73.39	1.91	-9.28*	1.89
Extreme Rural	80.32	1.49	-2.36	1.52
Fringes	85.88	0.54	3.21*	0.53
Big City	79.91	1.02	-2.76*	0.87
Medium City	86.50	1.63	3.83*	1.56
Small Place	81.82	0.74	-0.86	0.60
7th Grade	75.39	0.86	-7.28*	0.59
8th Grade	85.96	0.42	3.29*	0.21

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

Computation With Fractions (34 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	51.40	0.94		
Northeast	58.98	1.01	7.59*	1.12
Central	53.30	1.59	1.91	1.38
West	48.82	2.09	-2.58	1.76
Southeast	43.89	2.46	-7.50*	2.11
Male	49.51	0.98	-1.89*	0.31
Female	53.30	0.99	1.91*	0.31
White	55.42	0.82	4.02*	0.36
Hispanic	34.56	1.36	-16.84*	1.18
Black	31.96	1.14	-19.44*	1.32
Post High School	60.00	0.96	8.60*	0.52
Grad. High School	50.60	0.95	-0.79	0.66
Not Grad. High School	39.14	1.20	-12.25*	1.04
Advantaged Urban	61.61	1.43	10.22*	1.56
Disadvantaged Urban	37.52	2.29	-13.88*	2.20
Extreme Rural	46.18	3.23	-5.21	2.96
Fringes	57.44	1.54	6.05*	1.29
Big City	47.68	1.70	-3.71*	1.54
Medium City	58.89	2.98	7.50*	2.98
Small Place	48.69	1.55	-2.70*	1.27
7th Grade	34.20	1.10	-17.19*	0.70
8th Grade	58.67	0.93	7.28*	0.41

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages
1977

Computation With Decimals (18 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	54.70	1.02		
Northeast	61.60	1.30	6.90*	1.30
Central	58.57	1.60	3.87*	1.44
West	52.32	2.38	-2.38	1.98
Southeast	45.04	2.50	-9.66*	2.17
Male	50.85	1.09	-3.85*	0.44
Female	58.59	1.14	3.89*	0.43
White	58.84	0.87	4.14*	0.46
Hispanic	42.01	2.10	-12.69*	1.80
Black	32.95	1.67	-21.75*	1.55
Post High School	63.01	1.03	8.31*	0.56
Grad. High School	54.23	1.09	-0.47	0.57
Not Grad. High School	44.36	1.30	-10.34*	1.14
Advantaged Urban	65.81	2.25	11.11*	2.10
Disadvantaged Urban	37.08	1.89	-17.62*	1.86
Extreme Rural	47.92	4.33	-6.78	4.14
Fringes	60.49	1.98	5.79*	1.65
Big City	52.53	2.51	-2.17	2.07
Medium City	58.60	2.49	3.90	2.65
Small Place	52.16	1.37	-2.54*	1.14
7th Grade	35.90	1.14	-18.80*	0.90
8th Grade	62.67	0.99	7.97*	0.47

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Computation With Integers (22 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	38.22	0.96		
Northeast	43.22	1.44	5.00*	1.42
Central	40.51	2.09	2.29	1.66
West	34.99	1.97	-3.23	1.71
Southeast	33.75	2.04	-4.46*	1.81
Male	37.11	1.01	-1.11*	0.37
Female	39.36	1.06	1.14*	0.37
White	40.54	1.02	2.32*	0.34
Hispanic	27.13	1.94	-11.09*	1.85
Black	27.54	1.33	-10.67*	1.36
Post High School	45.25	1.25	7.03*	0.53
Grad. High School	36.80	0.90	-1.42	0.71
Not Grad. High School	29.84	0.87	-8.38*	0.82
Advantaged Urban	50.17	3.21	11.96*	2.84
Disadvantaged Urban	28.54	1.67	-9.68*	1.72
Extreme Rural	31.73	2.64	-6.49*	2.55
Fringes	45.83	1.85	7.61*	1.54
Big City	36.87	2.30	-1.35	1.82
Medium City	40.60	2.79	2.38	2.90
Small Place	34.56	1.26	-3.66*	1.10
7th Grade	22.47	0.54	-15.74*	0.82
8th Grade	44.34	1.22	6.12*	0.42

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Measurement Skills (32 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	54.75	0.65		
Northeast	58.64	1.12	3.89*	1.00
Central	58.83	1.24	4.08*	1.01
West	53.42	1.24	-1.33	1.10
Southeast	46.86	1.41	-7.89*	1.30
Male	57.11	0.73	2.36*	0.26
Female	52.36	0.68	-2.40*	0.28
White	58.83	0.55	4.08*	0.35
Hispanic	41.56	0.64	-13.19*	0.88
Black	33.53	0.93	-21.22*	1.08
Post High School	62.14	0.66	7.39*	0.38
Grad. High School	53.91	0.71	-0.84	0.53
Not Grad. High School	44.75	0.92	-10.00*	0.83
Advantaged Urban	65.16	1.31	10.41*	1.31
Disadvantaged Urban	41.16	2.16	-13.59*	2.09
Extreme Rural	50.91	2.48	-3.84	2.35
Fringes	59.40	1.18	4.65*	1.04
Big City	50.54	1.39	-4.21*	1.46
Medium City	59.18	2.78	4.42	2.68
Small Place	53.71	1.07	-1.04	0.92
7th Grade	45.73	0.78	-9.02*	0.50
8th Grade	58.89	0.61	4.14*	0.25

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Making Measurements (12 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	70.92	0.69		
Northeast	71.53	1.20	0.61	1.12
Central	76.23	1.32	5.31*	1.06
West	71.01	1.12	0.09	1.05
Southeast	63.27	1.81	-7.65*	1.57
Male	73.16	0.81	2.24*	0.39
Female	68.68	0.77	-2.24*	0.41
White	75.39	0.59	4.47*	0.47
Hispanic	58.44	1.53	-12.48*	1.63
Black	46.58	1.17	-24.34*	1.22
Post High School	77.47	0.71	6.55*	0.52
Grad. High School	70.41	0.90	-0.51	0.61
Not Grad. High School	61.38	1.30	-9.54*	1.22
Advantaged Urban	79.65	1.90	8.73*	1.81
Disadvantaged Urban	55.50	2.58	-15.42*	2.46
Extreme Rural	65.71	2.16	-5.21*	2.13
Fringes	74.70	1.27	3.77*	1.18
Big City	65.53	1.88	-5.39*	1.63
Medium City	74.53	2.42	3.61	2.30
Small Place	70.92	0.89	0.00	0.85
7th Grade	63.69	0.90	-7.24*	0.75
8th Grade	74.55	0.68	3.63*	0.34

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages
1977

Finding Perimeter, Area and Volume (12 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	45.06	0.68		
Northeast	49.51	1.37	4.45*	1.16
Central	48.26	1.14	3.20*	0.98
West	43.23	1.47	-1.83	1.24
Southeast	38.26	1.24	-6.80*	1.20
Male	46.54	0.72	1.48*	0.34
Female	43.57	0.81	-1.49*	0.35
White	48.45	0.62	3.39*	0.33
Hispanic	33.91	1.28	-11.15*	1.24
Black	27.53	0.97	-17.52*	1.11
Post High School	52.31	0.81	7.25*	0.57
Grad. High School	43.48	0.86	-1.58*	0.67
Not Grad. School	36.83	1.11	-8.22*	1.00
Advantaged Urban	56.74	1.01	11.68*	1.13
Disadvantaged Urban	33.48	2.41	-11.58*	2.34
Extreme Rural	41.82	2.60	-3.24	2.41
Fringes	50.27	1.35	5.21*	1.22
Big City	41.96	1.69	-3.10	1.59
Medium City	48.26	2.77	3.20	2.76
Small Place	43.47	1.33	-1.58	1.04
7th Grade	35.91	0.95	-9.15*	0.65
8th Grade	49.03	0.67	3.97*	0.31

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

Reading Graphs and Tables (27 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	68.85	0.65		
Northeast	73.46	1.02	4.62*	0.98
Central	70.58	1.26	1.73	1.05
West	67.60	1.08	-1.24	1.00
Southeast	63.13	1.80	-5.72*	1.53
Male	68.61	0.74	-0.24	0.28
Female	69.13	0.67	0.28	0.28
White	72.17	0.59	3.32*	0.36
Hispanic	57.44	0.96	-11.40*	1.08
Black	52.22	1.09	-16.63*	1.08
Post High School	75.15	0.66	6.30*	0.45
Grad. High School	68.12	0.83	-0.72	0.50
Not Grad. High School	60.90	0.99	-7.95*	0.81
Advantaged Urban	74.80	1.01	5.95*	1.06
Disadvantaged Urban	54.09	2.62	-14.75*	2.48
Extreme Rural	63.85	1.76	-5.00*	1.66
Fringes	71.62	0.97	2.77*	0.93
Big City	65.65	1.35	-3.20*	1.17
Medium City	74.82	2.38	5.97*	2.33
Small Place	67.99	1.06	-0.86	0.90
7th Grade	59.74	0.93	-9.11*	0.68
8th Grade	72.96	0.61	4.11*	0.32

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Geometric Manipulation (19 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	45.81	0.59		
Northeast	47.57	1.14	1.76	1.02
Central	48.38	1.39	2.57*	1.08
West	45.11	1.11	-0.70	0.98
Southeast	41.63	1.05	-4.18*	1.04
Male	46.49	0.66	0.68*	0.25
Female	45.10	0.63	-0.71*	0.25
White	48.17	0.60	2.36*	0.27
Hispanic	39.40	0.76	-6.41*	0.81
Black	33.41	0.68	-12.40*	0.81
Post High School	50.61	0.69	4.80*	0.41
Grad. High School	45.02	0.78	-0.79	0.50
Not Grad. High School	39.68	0.67	-6.13*	0.76
Advantaged Urban	52.43	1.20	6.62*	1.21
Disadvantaged Urban	37.68	1.47	-8.13*	1.58
Extreme Rural	40.34	1.41	-5.47*	1.38
Fringes	49.78	0.95	3.97*	0.84
Big City	43.62	1.16	-2.19	1.12
Medium City	49.76	2.55	3.96	2.41
Small Place	44.18	0.92	-1.63*	0.70
7th Grade	39.56	0.69	-6.25*	0.47
8th Grade	48.60	0.63	2.79*	0.20

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Algebraic Manipulation (43 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	52.17	0.72		
Northeast	57.01	1.35	4.84*	1.14
Central	55.70	1.33	3.53*	1.11
West	49.88	1.42	-2.29	1.25
Southeast	45.05	1.45	-7.12*	1.37
Male	51.28	0.74	-0.88*	0.23
Female	53.07	0.76	0.90*	0.24
White	55.92	0.63	3.75*	0.36
Hispanic	38.15	1.58	-14.02*	1.45
Black	33.58	1.02	-18.59*	1.20
Post High School	59.20	0.69	7.03*	0.37
Grad. High School	51.63	0.74	-0.54	0.47
Not Grad. High School	42.63	0.76	-9.54*	0.72
Advantaged Urban	61.83	0.83	9.66*	1.00
Disadvantaged Urban	36.63	1.63	-15.54*	1.65
Extreme Rural	47.68	2.79	-4.50	2.67
Fringes	57.06	1.14	4.90*	0.90
Big City	48.20	1.56	-3.97*	1.44
Medium City	58.31	2.63	6.14*	2.54
Small Place	50.62	1.14	-1.55	0.98
7th Grade	41.01	0.84	-11.16*	0.56
8th Grade	57.15	0.69	4.98*	0.30

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued)*. Age 13 -- Mean Performance Percentages 1977

Solving Equations (13 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	63.74	0.93		
Northeast	69.38	1.79	5.63*	1.51
Central	67.97	1.49	4.23*	1.31
West	60.79	2.08	-2.96*	1.76
Southeast	55.71	1.73	-8.03*	1.66
Male	61.38	0.98	-2.37*	0.36
Female	66.19	1.01	2.44*	0.38
White	67.86	0.78	4.12*	0.44
Hispanic	46.49	2.76	-17.25*	2.56
Black	43.93	1.40	-19.82*	1.54
Post High School	71.07	0.75	7.32*	0.49
Grad. High School	63.42	1.08	-0.32	0.63
Not Grad. High School	53.49	1.17	-10.25*	1.13
Advantaged Urban	73.80	1.37	10.05*	1.52
Disadvantaged Urban	47.24	1.76	-16.51*	1.89
Extreme Rural	58.13	3.11	-5.62	2.96
Fringes	69.80	1.39	6.06*	1.08
Big City	58.98	1.91	-4.77*	1.83
Medium City	70.45	3.31	6.70*	3.25
Small Place	61.87	1.49	-1.87	1.17
7th Grade	50.58	1.28	-13.17*	0.78
8th Grade	69.62	0.86	5.87*	0.38

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued)*. Age 13 -- Mean Performance Percentages 1977

	Plotting Points (15 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	57.04	0.87		
Northeast	62.58	1.52	5.55*	1.34
Central	61.75	1.70	4.71*	1.40
West	55.68	1.70	-1.36	1.50
Southeast	46.58	1.98	-10.46*	1.84
Male	57.22	0.96	0.18	0.34
Female	56.82	0.91	-0.21	0.34
White	61.67	0.75	4.63*	0.47
Hispanic	42.81	1.99	-14.22*	1.83
Black	32.57	1.62	-24.47*	1.69
Post High School	65.61	0.92	8.57*	0.48
Grad. High School	56.19	0.97	-0.85	0.65
Not Grad. High School	45.39	1.15	-11.64*	1.11
Advantaged Urban	68.24	1.52	11.20*	1.56
Disadvantaged Urban	38.81	2.46	-18.23*	2.38
Extreme Rural	50.50	3.39	-6.54*	3.27
Fringes	62.74	1.44	5.70*	1.20
Big City	51.83	2.22	-5.21*	1.96
Medium City	64.04	2.59	7.01*	2.53
Small Place	55.52	1.37	-1.51	1.16
7th Grade	43.75	1.00	-13.29*	0.72
8th Grade	63.00	0.84	5.96*	0.40

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Estimation		(22 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	32.75	0.55		
Northeast	35.40	1.16	2.65*	0.97
Central	35.47	0.95	2.72*	0.81
West	31.10	1.06	-1.66	0.94
Southeast	28.36	1.19	-4.39*	1.08
Male	34.16	0.56	1.40*	0.29
Female	31.34	0.69	-1.41*	0.30
White	35.17	0.54	2.42*	0.25
Hispanic	24.52	1.16	-8.24*	1.17
Black	19.88	0.62	-12.88*	0.77
Post High School	38.86	0.66	6.11*	0.38
Grad. High School	31.20	0.58	-1.55*	0.47
Not Grad. High School	24.96	0.62	-7.79*	0.70
Advantaged Urban	40.30	1.30	7.55*	1.32
Disadvantaged Urban	24.58	1.19	-8.17*	1.18
Extreme Rural	28.55	1.29	-4.20*	1.28
Fringes	36.24	1.09	3.48*	0.94
Big City	30.90	1.15	-1.35	1.07
Medium City	36.78	2.09	4.03*	1.99
Small Place	31.18	0.81	-1.57*	0.68
7th Grade	25.58	0.61	-7.17*	0.54
8th Grade	35.95	0.60	3.20*	0.22

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

Mathematical Understanding (108 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	51.72	0.49		
Northeast	54.74	0.78	3.02*	0.72
Central	54.65	0.98	2.92*	0.78
West	49.99	1.00	-1.73	0.38
Southeast	46.78	1.12	-4.94*	1.03
Male	51.86	0.49	0.14	0.20
Female	51.57	0.56	-0.16	0.20
White	54.75	0.41	3.03*	0.27
Hispanic	39.89	1.10	-11.83*	1.04
Black	36.96	0.61	-14.77*	0.80
Post High School	58.19	0.48	6.46*	0.32
Grad. High School	50.78	0.57	-0.94*	0.42
Not Grad. High School	43.43	0.59	-8.29*	0.61
Advantaged Urban	58.90	0.76	7.18*	0.84
Disadvantaged Urban	41.32	1.75	-10.40*	1.70
Extreme Rural	47.41	1.81	-4.31*	1.70
Fringes	55.65	0.80	3.93*	0.67
Big City	49.19	1.14	-2.54*	1.03
Medium City	55.03	1.90	3.30	1.85
Small Place	50.40	0.80	-1.32	0.68
7th Grade	42.90	0.57	-8.82*	0.42
8th Grade	55.58	0.48	3.35*	0.21

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages
1977

Mathematical Applications (106 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	43.34	0.50		
Northeast	46.04	0.89	2.70*	0.78
Central	45.92	1.00	2.58*	0.80
West	42.43	1.00	-0.91	0.87
Southeast	38.27	1.07	-5.08*	1.01
Male	44.13	0.53	0.78*	0.18
Female	42.53	0.52	-0.82*	0.19
White	46.12	0.43	2.77*	0.24
Hispanic	32.89	0.73	-10.45*	0.83
Black	29.69	0.57	-13.65*	0.73
Post High School	49.41	0.49	6.07*	0.31
Grad. High School	42.16	0.56	-1.18*	0.34
Not Grad. High School	35.81	0.56	-7.53*	0.66
Advantaged Urban	50.25	0.72	6.91*	0.83
Disadvantaged Urban	33.18	1.41	-10.16*	1.40
Extreme Rural	39.91	1.57	-3.44*	1.49
Fringes	47.50	0.83	4.15*	0.66
Big City	40.60	1.05	-2.74*	1.00
Medium City	47.02	1.64	3.67*	1.58
Small Place	41.99	0.77	-1.35*	0.65
7th Grade	35.30	0.62	-8.04*	0.40
8th Grade	46.88	0.47	3.53*	0.19

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Routine Problems (85 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	41.43	0.53		
Northeast	44.42	0.96	2.99*	0.83
Central	44.10	1.07	2.68*	0.86
West	40.37	1.08	-1.06	0.94
Southeast	36.09	1.02	-5.34*	1.01
Male	42.26	0.56	0.83*	0.19
Female	40.57	0.56	-0.86*	0.20
White	44.34	0.46	2.92*	0.26
Hispanic	30.60	0.56	-10.82*	0.72
Black	26.90	0.60	-14.53*	0.76
Post high School	47.84	0.53	6.42*	0.33
Grad. High School	40.21	0.58	-1.22*	0.37
Not Grad. High School	33.31	0.60	-8.12*	0.68
Advantaged-Urban	48.81	0.35	7.38*	0.94
Disadvantaged-Urban	30.47	1.55	-10.96*	1.54
Extreme Rural	37.91	1.65	-3.52*	1.57
Fringes	45.69	0.89	4.26*	0.71
Big City	38.62	1.11	-2.81*	1.06
Medium City	45.32	1.97	3.89*	1.89
Small Place	40.01	0.81	-1.42*	0.69
7th Grade	32.78	0.66	-8.65*	0.42
8th Grade	45.24	0.51	3.81*	0.21

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

One-Step Word Problems (27 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	52.08	0.68		
Northeast	56.69	1.35	4.60*	1.12
Central	54.90	1.25	2.81*	1.04
West	50.74	1.28	-1.34	1.14
Southeast	45.30	1.48	-6.78*	1.38
Male	52.33	0.72	0.24	0.30
Female	51.82	0.77	-0.26	0.32
White	55.69	0.59	3.60*	0.33
Hispanic	39.53	1.32	-12.55*	1.37
Black	33.72	0.71	-18.37*	0.92
Post High School	59.76	0.66	7.68*	0.38
Grad. High School	50.97	0.74	-1.11*	0.47
Not Grad. High School	42.76	0.80	-9.32*	0.82
Advantaged Urban	59.55	1.15	7.47*	1.27
Disadvantaged Urban	39.69	1.85	-12.40*	1.83
Extreme Rural	48.03	2.20	-4.05	2.08
Fringes	56.66	1.12	4.58*	0.92
Big City	48.19	1.29	-3.90*	1.27
Medium City	56.94	2.51	4.86*	2.40
Small Place	50.90	1.10	-1.19	0.38
7th Grade	40.99	0.88	-11.10*	0.56
8th Grade	57.04	0.61	4.96*	0.29

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Multistep Word Problems (13 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	36.82	0.66		
Northeast	39.05	1.08	2.23*	1.03
Central	40.00	1.40	3.18*	1.10
West	34.92	1.52	-1.90	1.27
Southeast	32.54	1.26	-4.27*	1.22
Male	38.49	0.84	1.67*	0.39
Female	35.09	0.70	-1.73*	0.41
White	39.54	0.66	2.72*	0.28
Hispanic	25.18	1.30	-11.64*	1.34
Black	24.17	1.14	-12.65*	1.19
Post High School	43.58	0.84	6.76*	0.45
Grad. High School	35.26	0.69	-1.56*	0.45
Not Grad. High School	29.00	0.95	-7.82*	1.00
Advantaged Urban	45.70	1.78	8.89*	1.60
Disadvantaged Urban	25.46	2.33	-11.36*	2.23
Extreme Rural	32.82	1.60	-4.00*	1.60
Fringes	41.10	1.36	4.28*	1.13
Big City	35.25	1.48	-1.57	1.23
Medium City	41.06	2.15	4.24	2.13
Small Place	34.81	0.82	-2.01*	0.75
7th Grade	27.61	0.83	-9.21*	0.59
8th Grade	40.82	0.73	4.00*	0.30

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

Graph and Table Problems (13 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	55.26	0.71		
Northeast	58.79	1.42	3.53*	1.20
Central	59.01	1.34	3.74*	1.10
West	54.72	1.64	-0.55	1.38
Southeast	47.54	1.23	-7.73*	1.30
Male	56.67	0.78	1.41*	0.33
Female	53.79	0.79	-1.47*	0.36
White	59.16	0.65	3.90*	0.40
Hispanic	41.78	1.12	-13.48*	1.20
Black	35.62	1.31	-19.64*	1.45
Post High School	63.72	0.87	8.46*	0.67
Grad. High School	53.79	0.91	-1.47	0.75
Not Grad. High School	43.80	1.27	-11.46*	1.40
Advantaged Urban	64.76	1.36	9.50*	1.43
Disadvantaged Urban	39.06	2.71	-16.21*	2.67
Extreme Rural	49.78	1.78	-5.48*	1.68
Fringes	61.81	1.34	6.55*	1.04
Big City	51.35	1.63	-3.92*	1.54
Medium City	59.99	2.46	4.73	2.43
Small Place	53.17	1.09	-2.09*	0.93
7th Grade	45.09	1.04	-10.17*	0.84
8th Grade	60.05	0.70	4.78*	0.36

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages 1977

	Geometric Problems (13 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	25.86	0.50		
Northeast	27.03	1.11	1.17	0.94
Central	26.41	0.94	0.55	0.79
West	26.21	1.00	0.35	0.86
Southeast	23.57	0.89	-2.30*	0.84
Male	26.78	0.56	0.92*	0.29
Female	24.88	0.59	-0.98*	0.29
White	27.03	0.52	1.17*	0.16
Hispanic	22.08	0.94	-3.78*	1.01
Black	19.53	0.73	-6.33*	0.68
Post High School	28.83	0.67	2.97*	0.38
Grad. High School	24.74	0.71	-1.12*	0.45
Not Grad. High School	22.55	0.60	-3.31*	0.71
Advantaged Urban	30.38	1.38	4.52*	1.31
Disadvantaged Urban	21.07	1.19	-4.79*	1.21
Extreme Rural	24.80	1.33	-1.06	1.33
Fringes	28.17	0.98	2.31*	0.84
Big City	24.33	0.83	-1.53	0.78
Medium City	28.54	1.16	2.67*	1.05
Small Place	24.96	0.66	-0.90	0.51
7th Grade	21.85	0.56	-4.01*	0.62
8th Grade	27.50	0.62	1.64*	0.22

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 7 *(Continued).* Age 13 -- Mean Performance Percentages
1977

Combination, Statistics and Probability Problems

(11 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	32.52	0.51		
Northeast	34.58	0.77	2.06*	0.72
Central	34.80	1.06	2.28*	0.84
West	31.57	0.84	-0.95	0.78
Southeast	28.49	1.15	-4.04*	1.02
Male	32.77	0.62	0.25	0.30
Female	32.27	0.57	-0.25	0.32
White	34.91	0.50	2.38*	0.25
Hispanic	21.48	0.90	-11.05*	1.07
Black	21.70	1.02	-10.83*	1.13
Post High School	37.16	0.52	4.64*	0.39
Grad. High School	31.72	0.63	-0.81*	0.33
Not Grad. High School	25.03	0.93	-7.49*	0.91
Advantaged Urban	39.87	1.25	7.34*	1.30
Disadvantaged Urban	25.09	0.97	-7.44*	1.04
Extreme Rural	28.68	1.69	-3.85*	1.58
Fringes	36.59	0.65	4.07*	0.66
Big City	30.89	1.11	-1.64	1.01
Medium City	34.54	1.36	2.01	1.34
Small Place	30.76	0.93	-1.77*	0.72
7th Grade	26.31	0.69	-6.21*	0.44
8th Grade	35.05	0.51	2.52*	0.20

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8. Age 17 -- Mean Performance Percentages
1978

	Mathematical Knowledge (140 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	71.71	0.45		
Northeast	74.16	0.78	2.45*	0.72
Central	74.17	0.92	2.46*	0.69
West	69.06	0.88	-2.65*	0.77
Southeast	68.17	0.62	-3.54*	0.66
Male	72.82	0.47	1.11*	0.20
Female	70.66	0.51	-1.05*	0.20
White	74.34	0.38	2.63*	0.24
Hispanic	59.89	0.92	-11.82*	0.85
Black	56.24	0.68	-15.47*	0.66
Post High School	77.23	0.38	5.52*	0.20
Grad. High School	69.21	0.48	-2.50*	0.26
Not Grad. High School	62.29	0.50	-9.42*	0.44
Advantaged Urban	79.35	0.78	7.64*	0.79
Disadvantaged Urban	59.22	1.04	-12.49*	1.11
Extreme Rural	70.60	0.92	-1.10	0.87
Fringes	74.37	0.92	2.66*	0.84
Big City	69.02	1.19	-2.69*	1.01
Medium City	74.92	1.24	3.21*	1.26
Small Place	70.97	0.52	-0.74	0.45
10th Grade	60.18	0.72	-11.53*	0.53
11th Grade	73.88	0.46	2.17*	0.16
12th Grade	74.72	0.54	3.01*	0.53

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages 1978

	Numbers and Numeration (68 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	77.90	0.43		
Northeast	79.44	0.82	1.54*	0.73
Central	80.34	0.85	2.45*	0.66
West	75.96	0.78	-1.93*	0.70
Southeast	74.67	0.81	-3.23*	0.76
Male	78.19	0.31	0.30	0.23
Female	77.62	0.47	-0.28	0.23
White	80.41	0.36	2.51*	0.24
Hispanic	67.30	1.06	-10.59*	1.00
Black	63.03	0.83	-14.87*	0.78
Post High School	82.89	0.36	5.00*	0.22
Grad. High School	75.50	0.54	-2.39*	0.30
Not Grad. High School	69.92	0.58	-7.97*	0.49
Advantaged Urban	84.58	0.82	6.68*	0.77
Disadvantaged Urban	65.99	1.15	-11.91*	1.16
Extreme Rural	77.55	0.92	-0.34	0.90
Fringes	80.33	0.84	2.43*	0.78
Big City	74.76	1.13	-3.14*	0.99
Medium City	81.36	0.93	3.46*	0.97
Small Place	77.40	0.52	-0.50	0.42
10th Grade	66.38	0.83	-11.52*	0.64
11th Grade	80.07	0.42	2.18*	0.19
12th Grade	81.10	0.51	3.20*	0.50

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Basic Facts		(23 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	93.74	0.29		
Northeast	94.57	0.64	0.83	0.55
Central	94.96	0.39	1.22*	0.38
West	92.80	0.56	-0.95	0.48
Southeast	92.19	0.73	-1.56*	0.63
Male	93.07	0.35	-0.67*	0.18
Female	94.38	0.33	0.64*	0.18
White	94.82	0.29	1.08*	0.19
Hispanic	91.13	1.32	-2.61*	1.27
Black	86.79	1.21	-6.95*	1.10
Post High School	95.85	0.33	2.11*	0.27
Grad. High School	92.90	0.49	-0.84*	0.32
Not Grad. High School	90.95	0.64	-2.79*	0.57
Advantaged Urban	96.14	0.29	2.40*	0.38
Disadvantaged Urban	89.31	1.14	-4.44*	1.16
Extreme Rural	93.76	0.69	0.01	0.64
Fringes	94.70	0.45	0.96	0.52
Big City	92.40	0.91	-1.34	0.77
Medium City	96.37	0.60	2.63*	0.58
Small Place	93.48	0.37	-0.26	0.30
10th Grade	87.60	1.36	-6.14*	1.16
11th Grade	94.84	0.25	1.10*	0.22
12th Grade	95.48	0.57	1.74*	0.52

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages 1978

	Ordering (11 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	64.48	0.79		
Northeast	66.92	1.47	2.44	1.31
Central	68.97	1.39	4.49*	1.15
West	61.48	1.79	-2.99	1.53
Southeast	58.26	1.67	-6.22*	1.54
Male	67.69	1.06	3.21*	0.56
Female	61.45	0.84	-3.03*	0.54
White	68.48	0.64	4.00*	0.44
Hispanic	48.02	2.89	-16.46*	2.82
Black	40.96	1.31	-23.52*	1.15
Post High School	72.13	0.73	7.65*	0.43
Grad. High School	61.02	0.99	-3.46*	0.61
Not Grad. High School	51.43	1.07	-13.05*	0.99
Advantaged Urban	74.77	1.65	10.29*	1.62
Disadvantaged Urban	46.07	2.58	-18.41*	2.51
Extreme Rural	64.88	1.39	0.40	1.55
Fringes	68.64	1.32	4.16*	1.20
Big City	59.90	1.92	-4.57*	1.64
Medium City	69.50	1.94	5.02*	2.04
Small Place	63.44	1.06	-1.04	0.85
10th Grade	49.50	1.28	-14.98*	1.05
11th Grade	67.22	0.76	2.74*	0.33
12th Grade	69.51	1.22	5.03*	1.14

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

Number and Operation Properties (18 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	77.24	0.57		
Northeast	78.88	1.05	1.64	0.96
Central	79.42	1.09	2.18*	0.84
West	75.30	1.30	-1.94	1.10
Southeast	74.29	0.87	-2.96*	0.89
Male	76.80	0.68	-0.44	0.35
Female	77.67	0.64	0.43	0.33
White	79.92	0.45	2.68*	0.34
Hispanic	64.90	1.47	-12.34*	1.42
Black	61.54	1.35	-15.70*	1.24
Post High School	83.08	0.56	5.84*	0.39
Grad. High School	74.04	0.88	-3.20*	0.60
Not Grad. High School	68.15	0.93	-9.09*	0.85
Advantaged Urban	84.79	1.10	7.55*	1.04
Disadvantaged Urban	61.98	1.74	-15.26*	1.54
Extreme Rural	76.16	1.02	-1.08	1.13
Fringes	79.98	1.26	2.74*	1.02
Big City	73.59	1.48	-3.65*	1.30
Medium City	80.04	1.56	2.80	1.53
Small Place	76.63	0.57	-0.61	0.59
10th Grade	62.91	1.34	-14.33*	1.20
11th Grade	80.09	0.35	2.85*	0.30
12th Grade	80.64	0.91	3.40*	0.78

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Geometry Knowledge (46 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	67.53	0.55		
Northeast	70.60	0.87	3.07*	0.83
Central	70.30	1.19	2.76*	0.88
West	64.38	1.16	-3.15*	1.00
Southeast	63.42	0.46	-4.11*	0.66
Male	68.96	0.52	1.43*	0.32
Female	66.18	0.72	-1.35*	0.30
White	70.45	0.47	2.92*	0.27
Hispanic	53.75	1.20	-13.78*	1.12
Black	50.44	0.87	-17.10*	0.80
Post High School	74.03	0.50	6.50*	0.26
Grad. High School	64.69	0.54	-2.85*	0.33
Not Grad. High School	55.80	0.60	-11.73*	0.56
Advantaged Urban	77.13	0.91	9.59*	1.00
Disadvantaged Urban	53.43	1.47	-14.11*	1.51
Extreme Rural	65.15	1.00	-2.38*	0.97
Fringes	70.82	1.12	3.29*	0.99
Big City	65.25	1.49	-2.28	1.22
Medium City	70.05	1.95	2.51	1.92
Small Place	66.46	0.62	-1.08	0.60
10th Grade	55.67	0.91	-11.86*	0.73
11th Grade	69.85	0.58	2.32*	0.18
12th Grade	70.10	0.92	2.57*	0.91

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued)*. Age 17 -- Mean Performance Percentages 1978

	Measurement Knowledge (17 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	78.71	0.51		
Northeast	80.35	0.71	1.64*	0.72
Central	81.61	0.95	2.90*	0.68
West	75.81	1.37	-2.90*	1.10
Southeast	75.70	0.67	-3.00*	0.73
Male	82.35	0.54	3.64*	0.31
Female	75.19	0.64	-3.52*	0.30
White	81.52	0.42	2.81*	0.31
Hispanic	66.88	1.91	-11.83*	1.71
Black	62.27	1.01	-16.44*	0.94
Post High School	83.03	0.44	4.32*	0.33
Grad. High School	77.40	0.66	-1.31*	0.44
Not Grad. High School	70.96	1.10	-7.74*	0.89
Advantaged-Urban	83.44	0.83	4.73*	0.88
Disadvantaged Urban	66.12	1.10	-12.59*	1.19
Extreme Rural	80.05	1.82	1.34	1.63
Fringes	79.60	1.02	0.89	0.90
Big City	75.40	1.23	-3.31*	1.09
Medium City	82.47	0.90	3.77*	1.00
Small Place	79.09	0.76	0.38	0.55
10th Grade	69.50	1.09	-9.20*	0.92
11th Grade	80.65	0.52	1.94*	0.20
12th Grade	79.75	0.85	1.04	0.79

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Mathematical Skills (273 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	58.97	0.53		
Northeast	62.32	1.11	3.35*	0.97
Central	61.57	1.04	2.60*	0.80
West	56.22	1.10	-2.74*	0.95
Southeast	54.34	0.74	-4.63*	0.81
Male	60.27	0.58	1.30*	0.21
Female	57.74	0.56	-1.23*	0.20
White	61.89	0.47	2.92*	0.27
Hispanic	46.95	0.76	-12.02*	0.74
Black	41.39	0.73	-17.58*	0.68
Post High School	65.23	0.50	6.26*	0.20
Grad. High School	56.01	0.51	-2.96*	0.29
Not Grad. High School	48.12	0.59	-10.84*	0.50
Advantaged Urban	68.72	0.98	9.76*	1.04
Disadvantaged Urban	45.59	1.27	-13.38*	1.37
Extreme Rural	56.42	0.91	-2.55*	0.90
Fringes	62.11	1.00	3.14*	0.97
Big City	56.88	1.51	-2.08	1.25
Medium City	64.43	1.54	5.46*	1.56
Small Place	57.40	0.63	-1.57*	0.56
10th Grade	45.64	0.79	-13.32*	0.54
11th Grade	61.25	0.56	2.28*	0.17
12th Grade	63.36	0.68	4.40*	0.64

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued)*. Age 17 -- Mean Performance Percentages
1978

	Computation (127 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	67.17	0.58		
Northeast	71.06	1.16	3.90*	1.03
Central	69.34	1.08	2.17*	0.86
West	64.22	1.23	-2.94*	1.05
Southeast	62.84	1.00	-4.33*	0.98
Male	67.65	0.62	0.48*	0.23
Female	66.72	0.62	-0.45*	0.22
White	70.09	0.51	2.92*	0.29
Hispanic	54.87	1.17	-12.30*	1.00
Black	49.60	0.93	-17.57*	0.87
Post High School	73.34	0.52	6.18*	0.26
Grad. High School	64.38	0.61	-2.79*	0.34
Not Grad. High School	56.27	0.74	-10.90*	0.62
Advantaged Urban	76.91	0.90	9.74*	1.00
Disadvantaged Urban	53.84	1.26	-13.33*	1.42
Extreme Rural	64.24	1.06	-2.93*	1.00
Fringes	70.22	1.05	3.05*	1.08
Big City	65.00	1.63	-2.16	1.38
Medium City	73.56	1.33	6.39*	1.41
Small Place	65.57	0.76	-1.60*	0.62
10th Grade	53.28	0.97	-13.89*	0.68
11th Grade	69.53	0.61	2.42*	0.18
12th Grade	71.12	0.33	3.96*	0.81

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Whole Number Computation (18 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	87.54	0.35		
Northeast	88.23	0.62	0.69	0.57
Central	88.32	0.64	0.78	0.53
West	86.48	0.67	-1.06	0.59
Southeast	86.81	0.90	-0.73	0.77
Male	86.91	0.45	-0.63*	0.22
Female	88.14	0.37	0.60*	0.21
White	88.86	0.30	1.32*	0.18
Hispanic	83.03	1.35	-4.51*	1.26
Black	79.48	0.87	-8.06*	0.75
Post High School	89.64	0.42	2.10*	0.26
Grad. High School	86.76	0.46	-0.78*	0.35
Not Grad. High School	83.72	0.80	-3.82*	0.67
Advantaged Urban	90.61	0.62	3.07*	0.63
Disadvantaged Urban	80.78	0.86	-6.76*	0.84
Extreme Rural	87.22	1.13	-0.32	1.06
Fringes	88.33	0.63	0.79*	0.57
Big City	85.86	0.81	-1.68*	0.65
Medium City	89.73	0.65	2.19*	0.69
Small Place	87.54	0.42	0.00	0.32
10th Grade	81.18	0.76	-6.36*	0.67
11th Grade	88.72	0.39	1.18*	0.16
12th Grade	88.84	0.65	1.30	0.68

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued)*. Age 17 -- Mean Performance Percentages
1978

	Computation With Fractions (30 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	65.82	0.67		
Northeast	70.53	1.27	4.81*	1.16
Central	66.91	1.30	1.09	1.01
West	63.68	1.33	-2.14	1.16
Southeast	61.16	1.41	-4.66*	1.32
Male	65.31	0.73	-0.51	0.30
Female	66.31	0.73	0.49	0.29
White	68.88	0.59	3.06*	0.36
Hispanic	51.49	1.66	-14.33*	1.58
Black	47.88	1.74	-17.93*	1.60
Post High School	72.03	0.67	6.21*	0.38
Grad. High School	63.38	0.79	-2.44*	0.52
Not Grad. High School	53.97	1.09	-11.84*	0.92
Advantaged Urban	76.23	1.05	10.41*	1.11
Disadvantaged Urban	52.47	1.61	-13.34*	1.74
Extreme Rural	61.40	1.68	-4.42*	1.58
Fringes	68.69	1.30	2.87*	1.29
Big City	63.99	1.93	-1.83	1.65
Medium City	72.34	2.35	6.52*	2.34
Small Place	64.22	0.93	-1.60	0.81
10th Grade	49.99	1.27	-15.82*	1.00
11th Grade	68.58	0.72	2.76*	0.24
12th Grade	69.60	1.26	3.78*	1.21

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Computation With Decimals (18 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	75.22	0.68		
Northeast	78.39	1.35	3.17*	1.20
Central	77.85	1.24	2.62*	0.99
West	72.06	1.18	-3.17*	1.08
Southeast	71.35	1.70	-3.87*	1.49
Male	74.42	0.78	-0.81*	0.32
Female	75.98	0.72	0.76*	0.31
White	78.51	0.58	3.29*	0.41
Hispanic	64.71	2.29	-10.51*	2.04
Black	54.72	1.42	-20.51*	1.23
Post High School	80.22	0.68	4.99*	0.40
Grad. High School	73.37	0.88	-1.85*	0.47
Not Grad. High School	66.36	1.12	-8.87*	0.96
Advantaged Urban	82.05	1.24	6.82*	1.31
Disadvantaged Urban	61.49	1.22	-13.73*	1.39
Extreme Rural	74.03	1.46	-1.19	1.40
Fringes	77.05	1.22	1.83	1.17
Big City	71.72	1.71	-3.51*	1.47
Medium City	82.35	1.33	7.12*	1.42
Small Place	74.74	0.90	-0.48	0.70
10th Grade	62.22	1.38	-13.00*	1.03
11th Grade	77.51	0.74	2.28*	0.29
12th Grade	78.84	1.10	3.62*	1.14

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages 1978

	Computation With Integers (21 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	68.09	0.91		
Northeast	72.94	1.70	4.85*	1.54
Central	70.79	1.51	2.70*	1.28
West	64.98	2.24	-3.11*	1.80
Southeast	61.99	1.44	-6.10*	1.44
Male	69.57	1.05	0.48	0.42
Female	67.65	0.94	-0.44	0.40
White	71.38	0.88	3.29*	0.36
Hispanic	53.48	2.80	-14.61*	2.41
Black	48.19	1.48	-19.90*	1.45
Post High School	77.39	0.82	9.29*	0.43
Grad. High School	63.27	0.92	-4.82*	0.62
Not Grad. High School	52.04	1.53	-16.06*	1.23
Advantaged Urban	81.92	1.89	13.83*	1.92
Disadvantaged Urban	52.78	2.14	-15.31*	2.24
Extreme Rural	60.74	1.84	-7.35	1.74
Fringes	73.94	1.58	5.85*	1.58
Big City	67.10	2.31	-0.99	2.06
Medium City	77.57	2.61	9.48*	2.50
Small Place	63.87	1.26	-4.22*	1.02
10th Grade	50.89	1.40	-17.20*	0.99
11th Grade	71.15	0.91	3.06*	0.25
12th Grade	72.71	1.45	4.62*	1.20

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Measurement Skills (21 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	56.72	0.68		
Northeast	58.86	1.18	2.14	1.09
Central	61.16	1.37	4.44*	1.03
West	54.02	1.44	-2.70*	1.26
Southeast	50.53	1.20	-6.19*	1.21
Male	61.65	0.77	4.93*	0.31
Female	52.07	0.70	-4.65*	0.29
White	60.46	0.57	3.74*	0.32
Hispanic	43.52	1.21	-13.20*	1.32
Black	33.26	0.86	-23.46*	0.85
Post High School	63.04	0.78	6.32*	0.33
Grad. High School	54.28	0.63	-2.44*	0.32
Not Grad. High School	44.93	0.70	-11.79*	0.68
Advantaged Urban	65.06	0.86	8.34*	0.96
Disadvantaged Urban	39.02	1.65	-17.70*	1.80
Extreme Rural	56.90	1.69	0.18	1.59
Fringes	58.59	1.01	1.87	0.96
Big City	53.35	1.99	-3.37*	1.60
Medium City	59.98	1.67	3.26	1.66
Small Place	56.91	0.80	0.19	0.64
10th Grade	44.67	1.04	-12.05*	0.76
11th Grade	59.07	0.72	2.35*	0.24
12th Grade	59.79	0.97	3.07*	0.97

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages 1978

	Reading Graphs and Tables (29 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	72.56	0.48		
Northeast	73.34	0.86	0.78	0.78
Central	76.03	0.64	3.47*	0.58
West	70.38	1.25	-2.18*	1.02
Southeast	68.78	0.93	-3.77*	0.88
Male	73.20	0.60	0.64*	0.32
Female	72.00	0.52	-0.56	0.30
White	75.42	0.40	2.86*	0.30
Hispanic	61.80	0.93	-10.75*	0.95
Black	55.96	0.97	-16.60*	0.90
Post High School	77.62	0.45	5.06*	0.32
Grad. High School	70.16	0.58	-2.40*	0.43
Not Grad. High School	63.79	0.85	-8.77*	0.73
Advantaged Urban	79.38	0.71	6.82*	0.85
Disadvantaged Urban	59.48	2.06	-13.08*	1.95
Extreme Rural	72.90	0.93	0.34	0.99
Fringes	74.50	0.78	1.94*	0.70
Big City	70.00	1.34	-2.56*	1.12
Medium City	76.05	1.21	3.50*	1.24
Small Place	72.24	0.62	-0.32	0.53
10th Grade	59.11	1.03	-13.44*	0.83
11th Grade	74.91	0.45	2.36*	0.21
12th Grade	76.97	0.84	4.42*	0.90

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Geometric Manipulation (15 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	54.76	0.71		
Northeast	55.22	1.16	0.46	1.10
Central	59.73	1.56	4.97*	1.12
West	53.57	1.35	-1.19	1.20
Southeast	47.86	0.72	-6.90*	0.94
Male	57.86	0.71	3.10*	0.40
Female	51.79	0.89	-2.98*	0.38
White	57.90	0.66	3.13*	0.35
Hispanic	41.72	1.41	-13.04*	1.55
Black	35.87	1.07	-18.89*	0.96
Post High School	60.50	0.80	5.74*	0.42
Grad. High School	52.60	0.91	-2.16*	0.66
Not Grad. High School	43.97	1.11	-10.80*	1.05
Advantaged Urban	64.53	1.53	9.77*	1.41
Disadvantaged Urban	41.17	1.67	-13.59*	1.82
Extreme Rural	53.56	1.23	-1.20	1.16
Fringes	57.92	1.17	3.16*	1.08
Big City	52.39	1.92	-2.37	1.58
Medium City	58.68	2.70	3.92	2.62
Small Place	53.54	0.88	-1.22	0.74
10th Grade	43.22	1.37	-11.54*	1.02
11th Grade	56.88	0.74	2.12*	0.28
12th Grade	57.87	1.22	3.11*	1.16

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Algebraic Manipulation (59 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	39.99	0.59		
Northeast	44.79	1.63	4.80*	1.33
Central	41.56	1.05	1.58	0.86
West	37.21	0.99	-2.78*	0.91
Southeast	35.39	0.66	-4.60*	0.79
Male	40.89	0.70	0.90*	0.26
Female	39.14	0.58	-0.85*	0.25
White	42.46	0.58	2.47*	0.24
Hispanic	28.49	0.70	-11.50*	0.80
Black	25.05	0.68	-14.94*	0.69
Post High School	46.95	0.64	6.96*	0.25
Grad. High School	36.19	0.57	-3.80*	0.32
Not Grad. High School	28.83	0.55	-11.16*	0.52
Advantaged Urban	51.45	1.63	11.46*	1.61
Disadvantaged Urban	28.34	1.10	-11.65*	1.17
Extreme Rural	35.24	0.80	-4.75*	0.88
Fringes	44.34	1.27	4.36*	1.16
Big City	39.16	1.41	-0.83	1.20
Medium City	45.63	2.72	5.64*	2.60
Small Place	37.05	0.52	-2.94*	0.59
10th Grade	27.08	0.65	-12.91*	0.54
11th Grade	41.93	0.62	1.94*	0.18
12th Grade	46.17	0.98	6.18*	0.74

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued)*. Age 17 -- Mean Performance Percentages
1978

	Solving Equations (16 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	35.20	0.67		
Northeast	41.62	1.75	6.41*	1.43
Central	36.32	1.31	1.12	1.04
West	32.37	1.07	-2.83*	1.02
Southeast	29.67	0.75	-5.54*	0.89
Male	35.80	0.81	0.68	0.40
Female	34.56	0.75	-0.64	0.39
White	38.05	0.66	2.84*	0.28
Hispanic	23.02	1.12	-12.19*	1.24
Black	17.95	0.91	-17.25*	0.88
Post High School	42.80	0.73	7.59*	0.28
Grad. High School	31.10	0.62	-4.10*	0.40
Not Grad. High School	22.68	0.83	-12.52*	0.67
Advantaged Urban	48.18	2.17	12.98*	2.12
Disadvantaged Urban	21.64	1.52	-13.56*	1.58
Extreme Rural	29.88	1.06	-5.32*	1.14
Fringes	39.50	1.42	4.30*	1.27
Big City	33.92	1.91	-1.28	1.57
Medium City	40.14	3.67	4.93	3.59
Small Place	32.44	0.64	-2.77*	0.82
10th Grade	20.35	0.92	-14.66*	0.70
11th Grade	37.36	0.71	2.16*	0.21
12th Grade	42.06	1.13	6.85*	1.01

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued)* Age 17 -- Mean Performance Percentages
1978

Simplifying and Factoring (11 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	32.90	0.83		
Northeast	41.13	2.41	8.24*	1.95
Central	33.18	1.29	0.28	1.14
West	29.18	1.52	-3.71*	1.35
Southeast	27.50	0.78	-5.40*	1.01
Male	32.59	1.06	-0.30	0.46
Female	33.19	0.81	0.29	0.44
White	35.28	0.86	2.38*	0.32
Hispanic	19.56	1.70	-13.34*	1.75
Black	18.54	1.19	-14.36*	1.14
Post High School	41.94	1.00	9.04*	0.53
Grad. High School	27.46	0.87	-5.44*	0.46
Not Grad. High School	19.68	1.07	-13.22*	1.24
Advantaged Urban	47.16	2.69	14.26*	2.65
Disadvantaged Urban	20.94	1.52	-11.96*	1.63
Extreme Rural	24.72	1.04	-8.17*	1.06
Fringes	38.43	1.93	5.54*	1.78
Big City	32.50	1.84	-0.39	1.6.
Medium City	41.50	3.93	8.60*	3.80
Small Place	28.77	0.78	-4.12*	0.78
10th Grade	16.99	1.06	-15.90*	1.11
11th Grade	35.31	0.94	2.41*	0.31
12th Grade	40.66	1.68	7.76*	1.45

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued)*. Age 17 -- Mean Performance Percentages
1978

Graphing Equalities and Inequalities (12 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	21.66	0.52		
Northeast	24.66	1.29	3.00*	1.07
Central	23.17	0.93	1.51*	0.76
West	18.83	0.87	-2.83*	0.80
Southeast	19.13	0.81	-2.52*	0.81
Male	23.17	0.68	1.52*	0.32
Female	20.21	0.52	-1.45*	0.30
White	23.18	0.56	1.53*	0.17
Hispanic	11.87	0.86	-9.79*	0.89
Black	13.13	0.54	-8.53*	0.64
Post High School	27.23	0.69	5.57*	0.34
Grad. High School	17.68	0.62	-3.98*	0.46
Not Grad. High School	14.60	0.62	-7.06*	0.60
Advantaged Urban	31.26	1.54	9.61*	1.48
Disadvantaged Urban	13.90	0.56	-7.76*	0.78
Extreme Rural	18.79	0.70	-2.86*	0.80
Fringes	25.45	1.10	3.79*	0.97
Big City	21.38	0.96	-0.27	0.95
Medium City	27.46	2.52	5.81*	2.41
Small Place	18.45	0.52	-3.21*	0.52
10th Grade	13.30	0.70	-8.36*	0.80
11th Grade	22.79	0.55	1.13*	0.16
12th Grade	26.62	1.22	4.96*	0.93

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages 1978

	Estimation (22 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	49.63	0.63		
Northeast	52.43	1.25	2.81*	1.10
Central	52.90	1.35	3.28*	1.00
West	46.28	0.98	-3.35*	0.95
Southeast	45.12	0.89	-4.51*	0.93
Male	52.96	0.68	3.34*	0.31
Female	46.47	0.71	-3.15*	0.31
White	52.89	0.59	3.26*	0.30
Hispanic	38.00	1.56	-11.62*	1.65
Black	30.12	0.90	-19.51*	0.98
Post High School	56.37	0.69	6.74*	0.36
Grad. High School	46.24	0.69	-3.39*	0.50
Not Grad. High School	38.08	0.83	-11.55*	0.74
Advantaged Urban	60.12	1.57	10.49*	1.49
Disadvantaged Urban	35.20	1.59	-14.42*	1.67
Extreme Rural	47.39	1.39	-1.74	1.44
Fringes	52.85	1.35	3.22*	1.13
Big City	46.71	1.54	-2.91*	1.31
Medium City	55.02	1.61	5.39*	1.69
Small Place	48.37	0.81	-1.26	0.72
10th Grade	36.16	0.98	-13.46*	0.79
11th Grade	51.98	0.68	2.36*	0.21
12th Grade	53.90	1.11	4.27*	1.05

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Mathematical Understanding (105 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	58.01	0.53		
Northeast	60.40	0.96	2.38*	0.88
Central	61.12	1.10	3.10*	0.81
West	55.26	0.96	-2.76*	0.88
Southeast	53.78	0.74	-4.23*	0.78
Male	59.86	0.57	1.84*	0.20
Female	56.24	0.57	-1.77*	0.20
White	61.01	0.48	3.00*	0.25
Hispanic	44.20	0.90	-13.82*	0.87
Black	40.65	0.59	-17.36*	0.61
Post High School	64.63	0.51	6.62*	0.20
Grad. High School	55.02	0.51	-3.00*	0.34
Not Grad. High School	46.50	0.59	-11.51*	0.57
Advantaged Urban	68.37	0.92	10.36*	0.95
Disadvantaged Urban	45.17	1.36	-12.84*	1.47
Extreme Rural	55.75	1.04	-2.26*	1.01
Fringes	61.52	0.95	3.50*	0.85
Big City	55.80	1.36	-2.22*	1.10
Medium City	60.86	1.70	2.85*	1.64
Small Place	56.71	0.63	-1.30*	0.56
10th Grade	44.88	0.72	-13.13*	0.52
11th Grade	60.26	0.57	2.24*	0.16
12th Grade	62.59	0.68	4.58*	0.66

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Mathematical Applications (136 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	43.48	0.49		
Northeast	46.05	0.91	2.57*	0.82
Central	46.61	1.04	3.13*	0.76
West	41.34	0.87	-2.14*	0.80
Southeast	38.26	0.65	-5.23*	0.74
Male	46.06	0.53	2.58*	0.22
Female	41.02	0.52	-2.47	0.21
White	46.45	0.43	2.97*	0.24
Hispanic	31.39	0.67	-12.10*	0.78
Black	25.66	0.46	-17.82*	0.54
Post High School	49.67	0.50	6.18*	0.19
Grad. High School	40.47	0.41	-3.01*	0.30
Not Grad. High School	32.65	0.47	-10.83*	0.50
Advantaged Urban	53.42	1.28	9.94*	1.20
Disadvantaged Urban	30.72	1.30	-12.76*	1.41
Extreme Rural	41.29	1.16	-2.20	1.12
Fringes	47.25	0.94	3.77*	0.84
Big City	41.08	1.36	-2.40*	1.11
Medium City	47.13	1.60	3.64*	1.60
Small Place	42.01	0.56	-1.47*	0.55
10th Grade	30.77	0.60	-12.72*	0.46
11th Grade	45.44	0.34	1.96*	0.14
12th Grade	48.98	0.67	5.50*	0.63

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Routine Problems		(114 Exercises)	
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	41.55	0.50		
Northeast	44.29	0.95	2.75*	0.85
Central	44.78	1.05	3.24*	0.77
West	39.28	0.90	-2.26*	0.82
Southeast	36.09	0.70	-5.46*	0.78
Male	44.13	0.36	2.59*	0.24
Female	39.07	0.34	-2.48*	0.24
White	44.60	0.44	3.06*	0.25
Hispanic	29.24	0.66	-12.31*	0.78
Black	23.03	0.51	-18.52*	0.56
Post High School	47.98	0.50	6.44*	0.20
Grad. High School	38.40	0.44	-3.14*	0.32
Not Grad. High School	30.37	0.51	-11.18*	0.52
Advantaged Urban	51.99	1.26	10.44*	1.21
Disadvantaged Urban	28.35	1.34	-13.20*	1.49
Extreme Rural	39.36	1.24	-2.18	1.16
Fringes	45.57	0.94	4.03*	0.86
Big City	38.98	1.42	-2.57*	1.16
Medium City	45.71	1.66	4.16*	1.66
Small Place	39.90	0.58	-1.64*	0.57
10th Grade	28.34	0.64	-13.21*	0.48
11th Grade	43.56	0.54	2.01*	0.15
12th Grade	47.45	0.68	5.90*	0.63

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	One-Step Word Problems (20 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	57.09	0.54		
Northeast	60.31	1.05	3.23*	0.92
Central	60.86	0.94	3.77*	0.75
West	54.63	1.08	-2.46*	0.95
Southeast	50.44	1.20	-6.65*	1.12
Male	59.71	0.53	2.63*	0.31
Female	54.56	0.68	-2.53*	0.30
White	60.64	0.42	3.56*	0.33
Hispanic	43.89	1.09	-13.20*	1.08
Black	35.38	1.06	-21.71*	0.95
Post High School	63.46	0.53	6.37*	0.28
Grad. High School	54.23	0.52	-2.86*	0.38
Not Grad. High School	46.17	0.93	-10.92*	0.80
Advantaged Urban	65.93	1.13	8.84*	1.18
Disadvantaged Urban	41.48	2.16	-15.60*	2.18
Extreme Rural	55.33	1.24	-1.76	1.22
Fringes	60.33	0.87	3.24*	0.90
Big City	53.17	1.66	-3.92*	1.40
Medium City	62.82	1.33	5.73*	1.46
Small Place	56.30	0.75	-0.79	0.63
10th Grade	41.51	1.05	-15.58*	0.81
11th Grade	59.72	0.52	2.63*	0.18
12th Grade	62.23	1.00	5.14*	0.87

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Multistep Word Problems (30 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	35.10	0.51		
Northeast	37.88	1.12	2.79*	0.96
Central	37.76	1.10	2.66*	0.81
West	32.55	0.84	-2.55*	0.80
Southeast	30.98	0.81	-4.12*	0.84
Male	37.64	0.67	2.54*	0.40
Female	32.66	0.62	-2.43*	0.40
White	38.32	0.48	3.22*	0.28
Hispanic	22.47	0.92	-12.63*	1.00
Black	15.93	0.65	-19.17*	0.73
Post High School	41.64	0.61	6.54*	0.31
Grad. High School	31.84	0.55	-3.25*	0.44
Not Grad. High School	23.38	0.71	-11.72*	0.76
Advantaged Urban	46.11	1.66	11.01*	1.53
Disadvantaged Urban	21.56	1.37	-13.54*	1.50
Extreme Rural	33.85	1.36	-1.24	1.37
Fringes	38.60	1.05	3.51*	0.90
Big City	32.11	1.41	-2.99*	1.18
Medium City	40.33	1.73	5.23*	1.76
Small Place	33.65	0.62	-1.44*	0.64
10th Grade	21.40	0.64	-13.70*	0.62
11th Grade	37.14	0.61	2.04*	0.22
12th Grade	41.71	1.05	6.62*	1.08

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued)*. Age 17 -- Mean Performance Percentages
1978

Graph and Table Problems (15 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	63.19	0.66		
Northeast	66.08	0.91	2.89*	0.94
Central	66.92	1.17	3.73*	0.89
West	61.56	1.71	-1.63	1.41
Southeast	55.79	0.72	-7.40*	0.88
Male	64.86	0.81	1.67*	0.41
Female	61.58	0.75	-1.62*	0.39
White	67.04	0.59	3.85*	0.36
Hispanic	46.27	1.64	-16.92*	1.71
Black	40.91	1.10	-22.28*	1.11
Post High School	70.02	0.62	6.83*	0.32
Grad. High School	60.73	0.65	-2.47*	0.46
Not Grad. High School	50.85	1.01	-12.34*	0.99
Advantaged Urban	72.56	1.11	9.37*	1.25
Disadvantaged Urban	50.24	2.81	-12.96*	2.80
Extreme Rural	59.74	2.14	-3.46	1.98
Fringes	68.58	0.86	5.39*	0.82
Big City	59.51	1.76	-3.69*	1.44
Medium City	65.74	2.00	2.54	1.96
Small Place	61.71	0.91	-1.49	0.76
10th Grade	47.66	1.14	-15.53*	0.84
11th Grade	65.73	0.67	2.53*	0.25
12th Grade	70.59	1.26	7.39*	1.20

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

	Geometric Problems (18 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	36.77	0.65		
Northeast	39.03	1.04	2.26*	0.99
Central	40.14	1.53	3.38*	1.09
West	34.40	1.11	-2.36*	1.04
Southeast	31.70	0.80	-5.07*	0.92
Male	40.04	0.73	3.27*	0.32
Female	33.69	0.69	-3.08*	0.30
White	39.24	0.63	2.47*	0.24
Hispanic	25.30	1.14	-11.47*	1.27
Black	20.82	0.89	-15.94*	0.91
Post High School	43.72	0.70	6.95*	0.29
Grad. High School	32.93	0.64	-3.84*	0.44
Not Grad. High School	25.85	0.84	-10.92*	0.77
Advantaged Urban	47.75	1.61	10.98*	1.49
Disadvantaged Urban	24.00	1.15	-12.76*	1.30
Extreme Rural	33.62	1.42	-3.15*	1.37
Fringes	41.96	1.46	5.20*	1.24
Big City	35.20	1.50	-1.56	1.26
Medium City	39.85	2.84	3.08	2.69
Small Place	34.24	0.66	-2.53*	0.66
10th Grade	25.25	0.91	-11.52*	0.73
11th Grade	38.54	0.67	1.78*	0.18
12th Grade	41.34	1.31	4.57*	1.06

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentages
1978

Measurement Problems (13 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	33.08	0.70		
Northeast	35.87	1.46	2.80*	1.28
Central	37.31	1.51	4.24*	1.11
West	30.80	1.03	-2.28*	1.01
Southeast	26.26	1.25	-6.81*	1.25
Male	36.97	0.88	3.90*	0.38
Female	29.33	0.69	-3.75*	0.39
White	36.29	0.68	3.22*	0.28
Hispanic	20.92	1.07	-12.15*	1.18
Black	13.38	0.80	-19.69*	0.86
Post High School	40.33	0.82	7.25*	0.37
Grad. High School	29.33	0.70	-3.74*	0.49
Not Grad. High School	20.24	0.69	-12.84*	0.80
Advantaged Urban	46.88	2.11	13.80*	1.83
Disadvantaged Urban	17.54	1.48	-15.54*	1.68
Extreme Rural	31.08	1.47	-1.99	1.45
Fringe	37.72	1.73	4.65*	1.44
Big City	30.66	1.77	-2.41	1.48
Medium City	36.92	2.34	3.84	2.34
Small Place	31.14	0.77	-1.94*	0.81
10th Grade	20.05	1.05	-13.03*	0.91
11th Grade	34.91	0.80	1.83*	0.25
12th Grade	39.85	1.18	6.77*	1.12

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentage
1978

	Nonroutine Problems (10 Exercises)			
	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	40.49	0.78		
Northeast	42.78	1.37	2.29	1.26
Central	43.41	1.88	2.92*	1.31
West	38.88	0.90	-1.61	1.03
Southeast	35.14	0.89	-5.35*	1.05
Male	43.76	0.99	3.27*	0.41
Female	37.34	0.75	-3.15*	0.42
White	43.43	0.76	2.94*	0.28
Hispanic	27.98	2.36	-12.51*	2.42
Black	23.40	0.94	-17.09*	1.12
Post High School	46.67	0.97	6.18*	0.48
Grad. High School	37.73	0.80	-2.76*	0.64
Not Grad. High School	28.33	0.97	-12.16*	1.02
Advantaged Urban	50.13	2.78	9.64*	2.28
Disadvantaged Urban	28.71	1.80	-11.78*	2.00
Extreme Rural	37.77	1.59	-2.72	1.60
Fringes	43.85	1.61	3.36*	1.16
Big City	38.62	1.87	-1.87	1.43
Medium City	40.37	2.35	-0.12	2.33
Small Place	39.83	0.80	-0.66	0.84
10th Grade	29.03	1.12	-11.46*	1.07
11th Grade	42.43	0.86	1.94*	0.28
12th Grade	44.05	1.70	3.56*	1.66

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 8 *(Continued).* Age 17 -- Mean Performance Percentage 1978

Combination, Statistics and Probability Problems (13 Exercises)

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation	25.50	0.43		
Northeast	27.06	1.03	1.56	0.88
Central	27.99	0.77	2.49*	0.61
West	23.94	0.62	-1.56*	0.61
Southeast	21.91	0.87	-3.59*	0.81
Male	27.56	0.54	2.06*	0.30
Female	23.52	0.49	-1.98*	0.29
White	27.46	0.45	1.97*	0.21
Hispanic	18.56	0.86	-6.94*	0.95
Black	13.47	0.65	-12.03*	0.60
Post High School	29.80	0.60	4.30*	0.33
Grad. High School	23.15	0.53	-2.35*	0.46
Not Grad. High School	18.15	0.69	-7.35*	0.70
Advantaged Urban	34.11	1.54	8.61*	1.46
Disadvantaged Urban	17.46	0.90	-8.04*	0.94
Extreme Rural	24.52	1.07	-0.98	1.00
Fringes	28.11	0.76	2.61*	0.85
Big City	24.77	1.34	-0.73	1.11
Medium City	28.50	0.68	3.00*	0.71
Small Place	23.88	0.60	-1.62*	0.47
10th Grade	17.27	0.72	-8.23*	0.63
11th Grade	26.63	0.50	1.13*	0.20
12th Grade	29.41	1.11	3.91*	1.05

**Indicates mean percentages significantly different from the nation at the .05 level.*

CHAPTER 4

PERFORMANCE FOR NONSTANDARD VARIABLE GROUPS FOR THE 1977-78 MATHEMATICS ASSESSMENT

In this chapter, data are presented and discussed for the variables that are not generally reported by National Assessment. These additional variables do not exhaust the possibilities for analysis of National Assessment data, but rather represent some work presently done that may be useful and of interest to readers of this report.

At age 9, data for two-way variables dealing with race or race/ethnicity are presented. The data presented are only for the sets of mathematical knowledge and skill exercises. Data for the other sets of exercises tended to have rather large standard errors for some groups and hence are not reported.

The data for 17-year-olds presented here donot include data for all the sets of exercises for which data were presented in the previous chapter. Again, a number of exercise sets have been excluded because of excessively large standard errors for small exercise sets. Some exercise sets at age 13 are not included but the same patterns of performance hold for them, as for the exercise sets that are reported for the use-of-the-calculator variable.

At age 9, the effects of sex seem about the same for both blacks and whites on the two exercise sets reported. The effects of grade in school seem about the same for blacks, Hispanos and whites.

There seem to be very different effects for type of community for blacks and whites at age 9. For whites, the disadvantaged-urban group is the poorest performing group, with performance 5 or 6% below the nation. For blacks, the extreme-rural group is the poorest performing group, with performance of 18 to 20% below the nation. For both blacks and whites, the advantaged-urban group had the highest performance.

For extreme-rural black 9-year-olds, 94% were also in the Southeastern region and 6% were in the Western region. On the other hand, for extreme-rural white 9-year-olds, 23% were in the Southeastern region, 14% in the Western region and 62% in the Central region. Since region of the country is related to performance, this may help explain the large performance deficit for blacks in rural areas.

Nine-year-old Hispanos and whites living in the Northeastern, Central, Western and Southeastern regions have similar patterns of performance to the national regional performance. Black 9-year-olds living in the Central and Western regions have approximately equal performances. The performance pattern

for blacks in the Northeast and the Southeast is the same as for the nation.

The use of electronic hand calculators appears to have had a different effect for 13-year-olds than for 17-year-olds. At age 17, the group that reported using hand calculators most often performed significantly better than the others across the exercise sets reported upon. However, for age 13, the groups that achieved the best were those who used calculators less than once a week and those who used calculators once a month. The performances of these two groups were always significantly better than the nation and were frequently not significantly different from each other. At age 13, the group that reported the most calculator use was usually not significantly different from the nation in performance. At both ages 13 and 17, the group of students that said they had never used a calculator was consistently the poorest in performance. This group was significantly below the nation and the other three groups in performance. At age 17, the performance of the groups was directly related to the amount of calculator use reported. Some caution should be exercised in looking at the data, since it may be related to access to calculators, which is probably related to socioeconomic status or the respondent and/or respondent's school.

The results for performance related to the number of hours 17-year-olds reported watching television were not surprising. The two groups (less than one hour and one-two hours) that reported watching TV two hours or less last night consistently did the best on the exercises assessed. Those watching TV five hours or more last night were significantly below the other groups and the nation in average performance across all exercises. Those who reported watching TV three to four hours a night were significantly below the nation on all exercise sets except whole number computation.

The course-taking variable for 17-year-olds is related to the average performance in a predictable fashion. Those who had taken more mathematics courses always performed better than those with fewer courses in mathematics. It is interesting to note the large increase in average performance on the geometry knowledge exercises for those who had taken Geometry over those who stopped at Algebra I. Again, some caution should be taken in attributing these results solely to the courses taken.

There were few large differences in average performance for 17-year-old males and females that have not taken Algebra I. Males in this group tended to perform about 2 percentage points better than females, with the exception of measurement skills and estimation skills, for which males were 8 and 5 percentage points higher than females. Females in this classification had the performance edge for some exercise sets, such as whole number computation. The difference between males' and females' performances grows, with males outperforming females as the level of course work increases to Geometry, Algebra II and greater than Algebra II. More exercise sets show large male performance advantages, and female performance advantages disappear altogether on the exercise sets reported. At age 17, the fact that fewer females than males take higher-level mathematics courses does not appear to explain the overall female deficit in performance at age 17.

Both black and white 17-year-olds show a rather wide range in performance when course-taking groups are compared. The effect of course taking seems to be roughly equivalent for the two races. Blacks who have taken more than Algebra II may be slightly further behind their white counterparts than blacks who have less than Algebra I are behind their white counterparts. Standard errors on some exercise sets are relatively large for blacks who have taken more than Algebra II.

TABLE 9. Age 9 Mean Performance Percentages 1977-78

		Mathematical Knowledge			
		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		65.94	0.44		
Male	Black	53.27	0.88	-12.66*	0.93
	White	67.82	0.47	1.88*	0.27
Female	Black	56.67	0.88	- 9.26*	0.89
	White	68.94	0.52	3.00*	0.32
Grade 3	Black	41.47	1.26	-24.46*	1.32
	Hispanic	44.79	1.18	-21.15*	1.14
	White	56.57	0.68	- 9.36*	0.53
Grade 4	Black	59.76	0.84	- 6.18*	0.87
	Hispanic	62.80	1.17	- 3.14*	1.07
	White	72.30	0.49	6.36*	0.31
Black	Advantaged urban	69.96	3.58	4.02	3.59
	Disadvantaged urban	52.70	1.73	-13.24*	1.74
	Extreme rural	45.48	3.22	-20.45*	3.30
White	Advantaged urban	75.22	0.80	9.28*	0.87
	Disadvantaged urban	59.61	1.42	- 6.33*	1.39
	Extreme rural	65.35	1.25	- 0.59	1.24
Black	Northeast	59.18	1.38	- 6.76*	1.38
	Central	55.16	2.78	-10.78*	2.72
	West	56.90	1.38	- 9.04*	1.40
	Southeast	51.89	1.12	-14.05*	1.21
Hispanic	Northeast	60.63	1.43	- 5.31*	1.42
	Central	59.99	3.80	- 3.77	3.72
	West	55.75	1.35	-10.19*	1.29
	Southeast	47.35	3.94	-18.59*	3.93
White	Northeast	72.20	0.68	6.26*	0.69
	Central	69.70	0.65	3.76*	0.55
	West	65.43	1.17	- 0.51	1.00
	Southeast	65.20	1.06	- 0.74	1.02

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 9 *(Continued)*. Age 9 Mean Performance Percentages 1977-78

		Mathematical Skills			
		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		43.34	0.40		
Male	Black	31.97	0.60	-11.37*	0.71
	White	45.48	0.41	2.15*	0.26
Female	Black	33.19	0.59	-10.15*	0.66
	White	45.81	0.54	2.47*	0.31
Grade 3	Black	24.07	0.98	-19.26*	1.02
	Hispanic	26.79	1.28	-16.55*	1.31
	White	34.94	0.63	- 8.40*	0.48
Grade 4	Black	35.56	0.52	- 7.78*	0.64
	Hispanic	39.82	1.12	- 3.51*	1.04
	White	49.13	0.47	5.79*	0.30
Black	Advantaged urban	44.16	3.22	0.82	3.27
	Disadvantaged urban	31.82	1.18	-11.51*	1.23
	Extreme rural	25.20	2.44	-18.13*	2.50
White	Advantaged urban	52.82	1.00	9.49*	1.04
	Disadvantaged urban	38.24	1.18	- 5.09*	1.09
	Extreme rural	43.50	1.57	0.16	1.54
Black	Northeast	36.10	0.94	- 7.24*	0.97
	Central	32.95	1.69	-10.38*	1.68
	West	33.34	1.37	- 9.99*	1.42
	Southeast	30.29	0.82	-13.05*	0.89
Hispanic	Northeast	38.96	1.75	- 4.37*	1.76
	Central	37.48	2.31	- 5.25*	2.23
	West	34.22	1.40	- 9.12*	1.36
	Southeast	31.07	5.56	-12.27*	5.51
White	Northeast	49.07	0.42	5.73*	0.51
	Central	47.11	0.77	3.78*	0.59
	West	42.95	0.97	- 0.39	0.87
	Southeast	42.42	0.93	- 0.91	0.90

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 10. Age 13 Mean Performance Percentages 1977-78

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Mathematical Knowledge (147 Exercises)				
Nation	66.87	0.52		
Use hand calculator more than once/week	66.50	0.66	-0.38	0.33
Use hand calculator less than once/week	70.67	0.65	3.79*	0.33
Use hand calculator once/month	70.64	0.54	3.77*	0.35
Never use hand calculator	63.50	0.56	-3.37*	0.27
Numbers and Numeration (86 Exercises)				
Nation	71.20	0.54		
Use hand calculator more than once/week	70.62	0.72	-0.57	0.39
Use hand calculator less than once/week	74.73	0.70	3.54*	0.40
Use hand calculator once/month	75.01	0.57	3.81*	0.35
Never use hand calculator	67.87	0.60	-3.32*	0.30
Geometry Knowledge (44 Exercises)				
Nation	57.30	0.58		
Use hand calculator more than once/week	57.08	0.69	-0.22	0.40
Use hand calculator less than once/week	61.32	0.81	4.03*	0.45
Use hand calculator once/month	60.89	0.77	3.59*	0.53
Never use hand calculator	54.07	0.60	-3.23*	0.33

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 10 *(Continued)*. Age 13 Mean Performance Percentages 1977-78

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Measurement Knowledge (17 Exercises)				
Nation	69.79	0.71		
Use hand calculator more than once/week	69.99	0.83	0.20	0.54
Use hand calculator less than once/week	74.28	1.03	4.49*	0.77
Use hand calculator once/month	73.79	0.90	4.00*	0.69
Never use hand calculator	65.79	0.93	-3.99*	0.55
Mathematical Skills (272 Exercises)				
Nation	51.88	0.65		
Use hand calculator more than once/week	51.36	0.82	-0.53	0.38
Use hand calculator less than once/week	56.47	0.82	4.58*	0.35
Use hand calculator once/month	55.99	0.65	4.11*	0.34
Never use hand calculator	47.93	0.60	-3.95*	0.32
Computation (129 Exercises)				
Nation	51.68	0.74		
Use hand calculator more than once/week	50.60	0.96	-1.08*	0.46
Use hand calculator less than once/week	55.94	0.93	4.26*	0.40
Use hand calculator once/month	56.22	0.78	4.54*	0.41
Never use hand calculator	47.91	0.66	-3.77*	0.36
Whole Number Computation (20 Exercises)				
Nation	82.67	0.49		
Use hand calculator more than once/week	81.48	0.68	-1.19*	0.49
Use hand calculator less than once/week	85.14	0.67	2.47*	0.45
Use hand calculator once/month	85.29	0.64	2.62*	0.58
Never use hand calculator	80.66	0.63	-2.01*	0.34

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 10 *(Continued)*. Age 13 Mean Performance Percentages 1977-78

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Measurement Skills (32 Exercises)				
Nation	54.75	0.65		
Use hand calculator more than once/week	54.95	0.79	0.20	0.48
Use hand calculator less than once/week	59.85	0.88	5.10*	0.47
Use hand calculator once/month	59.59	0.77	4.84*	0.53
Never use hand calculator	49.41	0.78	-5.34*	0.54
Reading Graphs and Tables (27 Exercises)				
Nation	68.85	0.65		
Use hand calculator more than once/week	68.59	0.95	-0.26	0.64
Use hand calculator less than once/week	73.97	0.85	5.12*	0.48
Use hand calculator once/month	72.16	0.71	3.31*	0.50
Never use hand calculator	65.62	0.65	-3.23*	0.45
Geometric Manipulation (19 Exercises)				
Nation	45.81	0.59		
Use hand calculator more than once/week	46.30	0.72	0.49	0.51
Use hand calculator less than once/week	50.10	0.84	4.30*	0.55
Use hand calculator once/month	48.47	0.78	2.66*	0.52
Never use hand calculator	42.14	0.67	-3.67*	0.44
Algebraic Manipulation (43 Exercises)				
Nation	52.17	0.72		
Use hand calculator more than once/week	51.24	0.96	-0.93*	0.45
Use hand calculator less than once/week	57.55	0.94	5.38*	0.51
Use hand calculator once/month	56.36	0.68	4.19*	0.45
Never use hand calculator	48.08	0.75	-4.09*	0.39

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 10 *(Continued)*. Age 13 Mean Performance Percentages 1977-78

	Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Estimation (22 Exercises)				
Nation	32.75	0.55		
Use hand calculator more than once/week	34.00	0.79	1.25	0.64
Use hand calculator less than once/week	36.54	1.03	3.78*	0.82
Use hand calculator once/month	35.37	0.75	2.62*	0.56
Never use hand calculator	28.88	0.70	-3.87*	0.42
Mathematical Understanding (108 Exercises)				
Nation	51.72	0.49		
Use hand calculator more than once/week	51.52	0.68	-0.21	0.39
Use hand calculator less than once/week	56.11	0.58	4.39*	0.35
Use hand calculator once/month	55.52	0.52	3.79*	0.35
Never use hand calculator	48.00	0.54	-3.73*	0.32
Mathematical Application (106 Exercises)				
Nation	43.34	0.50		
Use hand calculator more than once/week	42.80	0.67	-0.55	0.39
Use hand calculator less than once/week	47.13	0.67	3.79*	0.38
Use hand calculator once/month	47.37	0.52	4.03*	0.28
Never use hand calculator	39.79	0.52	-3.55*	0.30
Routine Problems (85 Exercises)				
Nation	41.43	0.53		
Use hand calculator more than once/week	40.98	0.71	-0.45	0.42
Use hand calculator less than once/week	45.53	0.70	4.10*	0.40
Use hand calculator once/month	45.58	0.56	4.15*	0.29
Never use hand calculator	37.56	0.55	-3.87*	0.31

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11. Age 17 Mean Performance Percentages 1977-78

Mathematical Knowledge (140 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		71.71	0.45		
Female	Took less than Algebra I	57.52	0.70	-14.19*	0.71
	Took Algebra I	65.27	0.50	- 6.44*	0.52
	Took Geometry	74.85	0.49	3.14*	0.46
	Took Algebra II	78.88	0.56	7.17*	0.60
	Took more than Algebra II	85.87	0.66	14.16*	0.56
Male	Took less than Algebra I	58.13	0.66	-13.58*	0.70
	Took Algebra I	67.48	0.52	- 4.23*	0.66
	Took Geometry	77.41	0.65	5.70*	0.58
	Took Algebra II	81.11	0.43	9.40*	0.56
	Took more than Algebra II	89.05	0.41	17.34*	0.53
Black	Took less than Algebra I	48.22	0.77	-23.49*	0.82
	Took Algebra I	57.30	1.03	-14.41*	1.16
	Took Geometry	63.58	1.28	- 8.13*	1.34
	Took Algebra II	64.99	1.39	- 6.72*	1.38
	Took more than Algebra II	72.27	2.37	0.56	2.31
White	Took less than Algebra I	60.48	0.45	-11.23*	0.58
	Took Algebra I	67.70	0.38	- 4.01*	0.53
	Took Geometry	77.50	0.48	5.79*	0.48
	Took Algebra II	81.64	0.44	9.93*	0.59
	Took more than Algebra II	88.62	0.44	16.91*	0.49
Use hand calculator more than once/week		77.22	0.47	5.52*	0.30
Use hand calculator less than once/week		74.06	0.44	2.35*	0.29
Use hand calculator once/month		70.47	0.56	- 1.24*	0.38
Never use hand calculator		64.53	0.59	- 7.18*	0.39
Watch TV less than 1 hour		73.72	0.52	2.01*	0.31
Watch TV 1 or 2 hours		73.96	0.49	2.25*	0.34
Watch TV 3 or 4 hours		70.55	0.53	- 1.16*	0.37
Watch TV 5 or more hours		65.08	0.71	- 6.63*	0.64
Took less than Algebra I		57.82	0.60	-13.89*	0.62
Took Algebra I		66.22	0.42	- 5.49*	0.50
Took Geometry		76.06	0.49	4.35*	0.43
Took Algebra II		79.95	0.45	8.24*	0.53
Took more than Algebra II		87.58	0.43	15.87*	0.43

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 *(Continued)*. Age 17 Mean Performance Percentages 1977-78

Numbers and Numeration (68 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		77.90	0.43		
Female	Took less than Algebra I	65.51	0.84	-12.39*	0.80
	Took Algebra I	75.15	0.64	- 2.74*	0.61
	Took Geometry	80.56	0.56	2.66*	0.52
	Took Algebra II	84.82	0.54	6.92*	0.57
	Took more than Algebra II	90.29	0.58	12.39*	0.56
Male	Took less than Algebra I	64.03	0.79	-13.87*	0.75
	Took Algebra I	75.49	0.72	- 2.41*	0.75
	Took Geometry	81.78	0.91	3.88*	0.80
	Took Algebra II	86.57	0.44	8.67*	0.54
	Took more than Algebra II	91.98	0.47	14.08*	0.53
Black	Took less than Algebra I	55.51	1.22	-22.38*	1.21
	Took Algebra I	66.62	1.28	-11.28*	1.33
	Took Geometry	68.69	1.56	- 9.21*	1.57
	Took Algebra II	70.69	1.33	- 7.20*	1.31
	Took more than Algebra II	78.19	2.89	0.29	2.83
White	Took less than Algebra I	67.24	0.52	-10.66*	0.56
	Took Algebra I	76.58	0.55	- 1.32*	0.60
	Took Geometry	82.60	0.52	4.70*	0.48
	Took Algebra II	87.32	0.43	9.42*	0.56
	Took more than Algebra II	92.07	0.44	14.17*	0.50
Use hand calculator more than once/week		82.49	0.46	4.59*	0.31
Use hand calculator less than once/week		80.08	0.39	2.18*	0.35
Use hand calculator once/month		77.19	0.59	- 0.70	0.41
Never use hand calculator		71.06	0.69	- 6.83*	0.46
Watch TV less than 1 hour		79.63	0.47	1.73*	0.34
Watch TV 1 or 2 hours		79.92	0.52	2.02*	0.35
Watch TV 3 or 4 hours		76.90	0.57	- 1.00*	0.40
Watch TV 5 or more hours		71.99	0.74	- 5.90*	0.68
Took less than Algebra I		64.75	0.65	-13.15*	0.59
Took Algebra I		75.25	0.55	- 2.65*	0.55
Took Geometry		81.12	0.57	3.23*	0.46
Took Algebra II		85.65	0.44	7.76*	0.50
Took more than Algebra II		91.21	0.42	13.32*	0.44

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued)*. Age 17 Mean Performance Percentages 1977-78

Geometry Knowledge (46 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		67.53	0.55		
Female	Took less than Algebra I	50.78	0.91	-16.76*	0.91
	Took Algebra I	56.55	0.67	-10.99*	0.69
	Took Geometry	74.15	0.77	6.62*	0.75
	Took Algebra II	76.14	0.77	8.61*	0.80
	Took more than Algebra II	82.43	1.14	14.90*	1.04
Male	Took less than Algebra I	52.58	0.91	-14.95*	0.94
	Took Algebra I	59.61	0.79	- 7.92*	0.92
	Took Geometry	76.96	0.66	9.43*	0.81
	Took Algebra II	77.87	0.66	10.34*	0.84
	Took more than Algebra II	86.31	0.57	18.77*	0.76
Black	Took less than Algebra I	41.02	1.09	-26.52*	1.12
	Took Algebra I	48.04	1.70	-19.49*	1.81
	Took Geometry	61.98	1.84	- 5.55*	1.93
	Took Algebra II	60.92	1.64	- 6.61*	1.65
	Took more than Algebra II	69.30	2.74	1.77	2.72
White	Took less than Algebra I	54.93	0.66	-12.60*	0.75
	Took Algebra I	59.64	0.48	- 7.89*	0.62
	Took Geometry	76.80	0.61	9.26*	0.71
	Took Algebra II	78.80	0.60	11.27*	0.80
	Took more than Algebra II	85.52	0.65	17.98*	0.70
Use hand calculator more than once/week		73.55	0.55	6.02*	0.39
Use hand calculator less than once/week		70.42	0.65	2.89*	0.44
Use hand calculator once/month		65.89	0.81	- 1.65*	0.60
Never use hand calculator		60.33	0.72	- 7.20*	0.54
Watch TV less than 1 hour		70.00	0.70	2.47*	0.41
Watch TV 1 or 2 hours		69.99	0.66	2.46*	0.50
Watch TV 3 or 4 hours		65.96	0.59	- 1.58*	0.51
Watch TV 5 or more hours		60.21	1.01	- 7.33*	0.95
Took less than Algebra I		51.68	0.75	-15.85*	0.77
Took Algebra I		57.95	0.50	- 9.58*	0.58
Took Geometry		75.49	0.55	7.95*	0.63
Took Algebra II		76.97	0.60	9.44*	0.72
Took more than Algebra II		84.52	0.61	16.98*	0.63

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued)*. Age 17 Mean Performance Percentages 1977-78

Mathematical Skills (273 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		58.97	0.53		
Female	Took less than Algebra I	41.44	0.56	-17.53*	0.61
	Took Algebra I	51.74	0.56	- 7.22*	0.67
	Took Geometry	59.67	0.63	0.70	0.53
	Took Algebra II	68.26	0.57	9.30*	0.63
	Took more than Algebra II	77.60	0.72	18.63*	0.68
Male	Took less than Algebra I	42.08	0.62	-16.88*	0.61
	Took Algebra I	54.07	0.72	- 4.90*	0.77
	Took Geometry	62.06	0.63	3.09*	0.56
	Took Algebra II	71.56	0.60	12.59*	0.66
	Took more than Algebra II	81.39	0.55	22.42*	0.61
Black	Took less than Algebra I	33.18	0.84	-25.78*	0.89
	Took Algebra I	42.22	0.71	-16.75*	0.81
	Took Geometry	47.33	0.90	-11.63*	0.97
	Took Algebra II	51.76	1.44	- 7.21*	1.42
	Took more than Algebra II	62.20	2.10	3.23	1.99
White	Took less than Algebra I	44.12	0.48	-14.85*	0.54
	Took Algebra I	54.49	0.52	- 4.48*	0.68
	Took Geometry	62.15	0.54	3.19*	0.50
	Took Algebra II	71.79	0.53	12.82*	0.66
	Took more than Algebra II	80.98	0.52	22.02*	0.59
Use hand calculator more than once/week		66.13	0.54	7.16*	0.26
Use hand calculator less than once/week		61.47	0.52	2.50*	0.34
Use hand calculator once/month		56.56	0.54	- 2.41*	0.33
Never use hand calculator		50.53	0.54	- 8.44*	0.30
Watch TV less than 1 hour		61.76	0.58	2.79*	0.31
Watch TV 1 or 2 hours		60.88	0.53	1.92*	0.34
Watch TV 3 or 4 hours		57.24	0.61	- 1.73*	0.33
Watch TV 5 or more hours		51.12	0.80	- 7.84*	0.62
Took less than Algebra I		41.75	0.54	-17.21*	0.55
Took Algebra I		52.76	0.58	- 6.21*	0.66
Took Geometry		60.73	0.53	1.76*	0.43
Took Algebra II		69.81	0.55	10.84*	0.61
Took more than Algebra II		79.65	0.54	20.68*	0.53

[a]Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 *(Continued)*. Age 17 Mean Performance Percentages 1977-78

Computation (127 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		67.17	0.58		
Female	Took less than Algebra I	48.32	0.83	-18.85*	0.77
	Took Algebra I	61.51	0.76	- 5.66*	0.80
	Took Geometry	69.35	0.75	2.18*	0.68
	Took Algebra II	78.08	0.59	10.91*	0.67
	Took more than Algebra II	86.41	0.58	19.25*	0.70
Male	Took less than Algebra I	47.03	0.82	-20.14*	0.64
	Took Algebra I	62.25	0.90	- 4.92*	0.90
	Took Geometry	70.66	0.78	3.49*	0.75
	Took Algebra II	80.44	0.69	13.27*	0.78
	Took more than Algebra II	88.27	0.55	21.10*	0.65
Black	Took less than Algebra I	39.97	1.28	-27.20*	1.24
	Took Algebra I	51.73	1.14	-15.44*	1.19
	Took Geometry	56.36	1.06	-10.81*	1.17
	Took Algebra II	61.88	1.87	- 5.29*	1.83
	Took more than Algebra II	72.70	2.44	5.53*	2.30
White	Took less than Algebra I	49.78	0.67	-17.39*	0.63
	Took Algebra I	63.58	0.70	- 3.59*	0.80
	Took Geometry	71.30	0.67	4.13*	0.66
	Took Algebra II	81.05	0.54	13.88*	0.70
	Took more than Algebra II	88.48	0.45	21.31*	0.65
Use hand calculator more than once/week		74.33	0.51	7.16*	0.28
Use hand calculator less than once/week		69.85	0.62	2.68*	0.38
Use hand calculator once/month		64.46	0.65	- 2.71*	0.41
Never use hand calculator		58.86	0.64	- 8.31*	0.39
Watch TV less than 1 hour		70.19	0.61	3.03*	0.38
Watch TV 1 or 2 hours		69.23	0.58	2.06*	0.36
Watch TV 3 or 4 hours		65.71	0.71	- 1.46*	0.43
Watch TV 5 or more hours		58.68	0.92	- 8.49*	0.71
Took less than Algebra I		47.67	0.76	-19.50*	0.64
Took Algebra I		61.83	0.74	- 5.34*	0.76
Took Geometry		69.90	0.62	2.73*	0.56
Took Algebra II		79.19	0.57	12.02*	0.66
Took more than Algebra II		87.42	0.48	20.25*	0.59

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued)*. Age 17 Mean Performance Percentages 1977-78

Whole Number Computation (18 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		87.54	0.35		
Female	Took less than Algebra I	82.65	1.21	- 4.89*	1.08
	Took Algebra I	87.61	0.72	0.07	0.68
	Took Geometry	89.54	0.63	2.00*	0.56
	Took Algebra II	91.52	0.53	3.98*	0.56
	Took more than Algebra II	93.36	0.68	5.82	0.71
Male	Took less than Algebra I	80.36	0.95	- 7.18*	0.83
	Took Algebra I	85.75	0.98	- 1.79*	0.88
	Took Geometry	88.68	0.73	1.14*	0.66
	Took Algebra II	91.68	0.52	4.14*	0.50
	Took more than Algebra II	93.69	0.64	6.15*	0.67
Black	Took less than Algebra I	75.66	1.36	-11.88*	1.25
	Took Algebra I	81.39	1.74	- 6.15*	1.69
	Took Geometry	83.92	1.31	- 3.62*	1.31
	Took Algebra II	85.73	1.68	- 1.81	1.64
	Took more than Algebra II	87.78	2.97	0.24	2.97
White	Took less than Algebra I	83.09	0.80	- 4.45*	0.66
	Took Algebra I	87.76	0.59	0.22	0.55
	Took Geometry	89.86	0.56	2.32*	0.48
	Took Algebra II	92.16	0.41	4.62*	0.43
	Took more than Algebra II	93.82	0.48	6.28*	0.53
Use hand calculator more than once/week		89.55	0.46	2.01*	0.32
Use hand calculator less than once/week		88.08	0.61	0.54	0.51
Use hand calculator once/month		87.39	0.43	- 0.15	0.35
Never use hand calculator		85.40	0.64	- 2.14*	0.52
Watch TV less than 1 hour		88.14	0.42	0.60	0.33
Watch TV 1 or 2 hours		88.93	0.41	1.39*	0.29
Watch TV 3 or 4 hours		87.80	0.56	0.26	0.44
Watch TV 5 or more hours		84.82	1.02	- 2.72*	0.89
Took less than Algebra I		81.52	0.82	- 6.02*	0.63
Took Algebra I		86.83	0.59	- 0.71	0.50
Took Geometry		89.11	0.52	1.57*	0.42
Took Algebra II		91.60	0.39	4.06*	0.39
Took more than Algebra II		93.59	0.48	6.05*	0.52

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued).* Age 17 Mean Performance Percentages 1977-78

Measurement Skill (21 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		56.72	0.68		
Female	Took less than Algebra I	38.41	0.79	-18.31*	0.82
	Took Algebra I	45.60	0.88	-11.12*	0.90
	Took Geometry	54.68	0.99	- 2.04*	0.90
	Took Algebra II	61.06	0.98	4.34*	0.92
	Took more than Algebra II	72.40	1.15	15.68*	1.06
Male	Took less than Algebra I	46.77	1.18	- 9.95*	1.00
	Took Algebra I	56.65	1.09	- 0.07	1.28
	Took Geometry	64.06	1.26	7.34*	1.06
	Took Algebra II	70.54	0.93	13.82*	0.74
	Took more than Algebra II	79.98	0.87	23.26*	0.76
Black	Took less than Algebra I	27.70	1.69	-29.02*	1.82
	Took Algebra I	33.54	1.66	-23.17*	1.76
	Took Geometry	38.39	1.84	-18.33*	1.94
	Took Algebra II	39.80	1.76	-16.92*	1.78
	Took more than Algebra II	53.72	2.68	- 3.00	2.65
White	Took less than Algebra I	46.65	0.82	-10.07*	0.68
	Took Algebra I	53.20	0.80	- 3.52*	1.00
	Took Geometry	61.08	0.88	4.36*	0.74
	Took Algebra II	68.12	0.90	11.40*	0.87
	Took more than Algebra II	78.36	0.74	21.64*	0.71
Use hand calculator more than once/week		63.39	0.78	6.67*	0.46
Use hand calculator less than once/week		60.48	0.83	3.76*	0.54
Use hand calculator once/month		55.08	0.74	- 1.64*	0.45
Never use hand calculator		47.53	0.65	- 9.19*	0.46
Watch TV less than 1 hour		59.60	0.80	2.88*	0.49
Watch TV 1 or 2 hours		59.24	0.82	2.52*	0.51
Watch TV 3 or 4 hours		54.62	0.76	- 2.10*	0.57
Watch TV 5 or more hours		47.72	1.19	- 9.00*	1.09
Took less than Algebra I		42.62	0.78	-14.10*	0.62
Took Algebra I		50.45	0.78	- 6.27*	0.90
Took Geometry		58.97	0.91	2.25*	0.72
Took Algebra II		65.51	0.87	8.79*	0.76
Took more than Algebra II		76.46	0.74	19.74*	0.62

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued).* Age 17 Mean Performance Percentages 1977-78

Algebraic Manipulation (59 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		39.99	0.59		
Female	Took less than Algebra I	21.96	0.44	-18.03*	0.65
	Took Algebra I	30.30	0.55	- 9.69*	0.70
	Took Geometry	37.62	0.65	- 2.37*	0.59
	Took Algebra II	52.18	0.75	12.19*	0.75
	Took more than Algebra II	65.56	1.19	25.57*	0.99
Male	Took less than Algebra I	22.79	0.36	-17.20*	0.68
	Took Algebra I	31.44	0.64	- 8.55*	0.81
	Took Geometry	37.93	0.75	- 2.06*	0.64
	Took Algebra II	52.83	0.81	12.84*	0.76
	Took more than Algebra II	69.02	1.05	29.04*	0.93
Black	Took less than Algebra I	17.47	0.72	-22.52*	0.96
	Took Algebra I	24.05	1.09	-15.94*	1.17
	Took Geometry	28.52	1.09	-11.46*	1.10
	Took Algebra II	35.87	1.50	- 4.12*	1.49
	Took more than Algebra II	47.97	2.56	7.98*	2.46
White	Took less than Algebra I	23.68	0.33	-16.31*	0.61
	Took Algebra I	31.74	0.46	- 8.25*	0.67
	Took Geometry	38.76	0.60	- 1.22*	0.54
	Took Algebra II	54.41	0.72	14.42*	0.74
	Took more than Algebra II	68.88	0.98	28.89*	0.82
Use hand calculator more than once/week		48.14	0.73	8.15*	0.36
Use hand calculator less than once/week		41.94	0.62	1.95*	0.42
Use hand calculator once/month		36.86	0.60	- 3.12*	0.42
Never use hand calculator		30.93	0.55	- 9.06*	0.38
Watch TV less than 1 hour		42.72	0.75	2.73*	0.37
Watch TV 1 or 2 hours		41.50	0.62	1.51*	0.43
Watch TV 3 or 4 hours		37.91	0.68	- 2.08*	0.38
Watch TV 5 or more hours		32.62	0.90	- 7.36*	0.70
Took less than Algebra I		22.37	0.32	-17.62*	0.61
Took Algebra I		30.80	0.48	- 9.18*	0.67
Took Geometry		37.73	0.58	- 2.26*	0.47
Took Algebra II		52.48	0.71	12.49*	0.68
Took more than Algebra II		67.43	0.96	27.45*	0.74

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued)*. Age 17 Mean Performance Percentages 1977-78

Estimation (22 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		49.63	0.63		
Female	Took less than Algebra I	30.69	0.91	-18.94*	0.84
	Took Algebra I	40.11	1.05	- 9.52*	1.16
	Took Geometry	48.08	1.02	- 1.54	0.85
	Took Algebra II	55.99	0.91	6.36*	0.84
	Took more than Algebra II	65.64	1.49	16.02*	1.30
Male	Took less than Algebra I	35.44	0.91	-14.19*	1.02
	Took Algebra I	45.07	1.19	- 4.56*	1.15
	Took Geometry	55.40	1.20	5.78*	0.99
	Took Algebra II	63.65	0.92	14.02*	1.01
	Took more than Algebra II	75.46	1.08	25.83*	1.22
Black	Took less than Algebra I	21.63	1.19	-28.00*	1.29
	Took Algebra I	30.31	2.26	-19.32*	2.34
	Took Geometry	34.87	1.62	-14.76*	1.70
	Took Algebra II	36.82	1.85	-12.81*	1.90
	Took more than Algebra II	48.47	2.92	- 1.16	2.84
White	Took less than Algebra I	36.01	0.75	-13.62*	0.78
	Took Algebra I	44.18	0.95	- 5.45*	1.02
	Took Geometry	53.53	0.94	3.90*	0.70
	Took Algebra II	61.90	0.84	12.27*	0.89
	Took more than Algebra II	73.00	1.03	23.37*	1.02
Use hand calculator more than once/week		57.50	0.81	7.88*	0.47
Use hand calculator less than once/week		52.40	0.89	2.77*	0.72
Use hand calculator once/month		47.78	0.68	- 1.85*	0.50
Never use hand calculator		40.44	0.82	- 9.19*	0.62
Watch TV less than 1 hour		52.52	0.76	2.90*	0.41
Watch TV 1 or 2 hours		51.83	0.73	2.21*	0.56
Watch TV 3 or 4 hours		47.60	0.88	- 2.03*	0.67
Watch TV 5 or more hours		42.43	1.14	- 7.20*	1.05
Took less than Algebra I		33.08	0.73	-16.55*	0.73
Took Algebra I		42.23	0.90	- 7.40*	0.91
Took Geometry		51.47	0.91	1.84*	0.63
Took Algebra II		59.66	0.81	10.03*	0.82
Took more than Algebra II		70.93	0.96	21.30*	0.88

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued)*. Age 17 Mean Performance Percentages 1977-78

Mathematical Understanding (105 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		58.01	0.53		
Female	Took less than Algebra I	40.90	0.66	-17.11*	0.69
	Took Algebra I	50.13	0.62	- 7.88*	0.74
	Took Geometry	59.92	0.58	1.91*	0.59
	Took Algebra II	65.33	0.56	7.31*	0.63
	Took more than Algebra II	75.57	0.90	17.55*	0.81
Male	Took less than Algebra I	42.65	0.48	-15.36*	0.66
	Took Algebra I	52.72	0.72	- 5.30*	0.70
	Took Geometry	63.75	0.75	5.74*	0.65
	Took Algebra II	69.58	0.69	11.57*	0.73
	Took more than Algebra II	80.27	0.54	22.26*	0.58
Black	Took less than Algebra I	33.84	0.68	-24.17*	0.83
	Took Algebra I	39.91	0.84	-18.10*	1.00
	Took Geometry	47.27	1.22	-10.74*	1.33
	Took Algebra II	48.42	1.26	- 9.59*	1.23
	Took more than Algebra II	62.21	2.47	4.20	2.30
White	Took less than Algebra I	44.15	0.58	-13.87*	0.70
	Took Algebra I	53.32	0.55	- 4.69*	0.66
	Took Geometry	63.40	0.50	5.38*	0.48
	Took Algebra II	69.46	0.52	11.45*	0.66
	Took more than Algebra II	79.48	0.55	21.47*	0.59
Use hand calculator more than once/week		65.02	0.55	7.00*	0.23
Use hand calculator less than once/week		60.52	0.60	2.50*	0.36
Use hand calculator once/month		56.22	0.53	- 1.80*	0.35
Never use hand calculator		49.24	0.50	- 8.78*	0.39
Watch TV less than 1 hour		60.56	0.62	2.55*	0.27
Watch TV 1 or 2 hours		60.56	0.56	2.54*	0.31
Watch TV 3 or 4 hours		56.05	0.54	- 1.96*	0.35
Watch TV 5 or more hours		50.16	0.82	- 7.85*	0.75
Took less than Algebra I		41.78	0.52	-16.23*	0.63
Took Algebra I		51.31	0.57	- 6.71*	0.63
Took Geometry		61.69	0.50	3.68*	0.44
Took Algebra II		67.35	0.56	9.34*	0.63
Took more than Algebra II		78.22	0.57	20.21*	0.54

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued).* Age 17 Mean Performance Percentages 1977-78

Mathematical Applications (136 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		43.48	0.49		
Female	Took less than Algebra I	27.95	0.37	-15.53*	0.54
	Took Algebra I	34.53	0.61	- 8.96*	0.63
	Took Geometry	43.53	0.52	0.04	0.49
	Took Algebra II	48.73	0.64	5.24*	0.63
	Took more than Algebra II	60.29	0.94	16.80*	0.90
Male	Took less than Algebra I	30.39	0.48	-13.09*	0.59
	Took Algebra I	38.92	0.72	- 4.56*	0.79
	Took Geometry	48.07	0.70	4.59*	0.68
	Took Algebra II	55.06	0.74	11.58*	0.74
	Took more than Algebra II	67.69	0.66	24.21*	0.61
Black	Took less than Algebra I	20.50	0.43	-22.98*	0.63
	Took Algebra I	25.41	0.73	-18.07*	0.82
	Took Geometry	30.36	0.81	-13.12*	0.98
	Took Algebra II	30.04	0.81	-13.44*	0.88
	Took more than Algebra II	41.54	2.85	- 1.94	2.78
White	Took less than Algebra I	31.55	0.35	-11.93*	0.54
	Took Algebra I	38.27	0.54	- 5.21*	0.67
	Took Geometry	47.36	0.43	3.88*	0.47
	Took Algebra II	53.95	0.67	10.46*	0.71
	Took more than Algebra II	66.27	0.63	22.79*	0.61
Use hand calculator more than once/week		50.72	0.61	7.23*	0.29
Use hand calculator less than once/week		45.59	0.55	2.11*	0.32
Use hand calculator once/month		41.29	0.50	- 2.19*	0.34
Never use hand calculator		34.83	0.39	- 8.65*	0.39
Watch TV less than 1 hour		46.41	0.60	2.93*	0.29
Watch TV 1 or 2 hours		45.62	0.48	2.14*	0.33
Watch TV 3 or 4 hours		41.28	0.53	- 2.20*	0.32
Watch TV 5 or more hours		34.99	0.70	- 8.49*	0.62
Took less than Algebra I		29.17	0.37	-14.31*	0.51
Took Algebra I		36.43	0.57	- 7.05*	0.62
Took Geometry		45.64	0.48	2.16*	0.45
Took Algebra II		51.71	0.62	8.23*	0.61
Took more than Algebra II		64.45	0.66	20.97*	0.58

**Indicates mean percentages significantly different from the nation at the .05 level.*

TABLE 11 *(Continued).* Age 17 Mean Performance Percentages 1977-78

Routine Problems (114 Exercises)

		Mean Percentage	Standard Error	Mean Percent Difference From Nation	Standard Error
Nation		41.55	0.50		
Female	Took less than Algebra I	25.45	0.40	-16.10*	0.60
	Took Algebra I	32.13	0.68	- 9.41*	0.67
	Took Geometry	41.59	0.57	0.04	0.55
	Took Algebra II	47.07	0.65	5.52*	0.64
	Took more than Algebra II	59.31	1.05	17.76*	1.00
Male	Took less than Algebra I	27.72	0.56	-13.82*	0.66
	Took Algebra I	36.79	0.72	- 4.76*	0.78
	Took Geometry	46.24	0.73	4.69*	0.68
	Took Algebra II	53.50	0.79	11.96*	0.77
	Took more than Algebra II	66.69	0.67	25.14*	0.63
Black	Took less than Algebra I	17.55	0.45	-24.00*	0.64
	Took Algebra I	22.67	0.76	-18.87*	0.86
	Took Geometry	28.10	0.86	-13.45*	1.01
	Took Algebra II	27.54	0.91	-14.01*	0.97
	Took more than Algebra II	40.18	3.02	- 1.37	2.95
White	Took less than Algebra I	29.10	0.39	-12.45*	0.60
	Took Algebra I	36.04	0.55	- 5.50*	0.66
	Took Geometry	45.47	0.46	3.93*	0.48
	Took Algebra II	52.43	0.68	10.88*	0.72
	Took more than Algebra II	65.26	0.66	23.72*	0.65
Use hand calculator more than once/week		49.14	0.62	7.59*	0.31
Use hand calculator less than once/week		43.73	0.58	2.19*	0.34
Use hand calculator once/month		39.27	0.52	- 2.28*	0.38
Never use hand calculator		32.49	0.42	- 9.06*	0.41
Watch TV less than 1 hour		44.60	0.62	3.05*	0.31
Watch TV 1 or 2 hours		43.66	0.48	2.12*	0.34
Watch TV 3 or 4 hours		39.38	0.56	- 2.16*	0.35
Watch TV 5 or more hours		32.87	0.72	- 8.68*	0.63
Took less than Algebra I		26.58	0.40	-14.96*	0.56
Took Algebra I		34.15	0.60	- 7.40*	0.62
Took Geometry		43.76	0.51	2.21*	0.46
Took Algebra II		50.11	0.64	8.56*	0.63
Took more than Algebra II		63.48	0.70	21.94*	0.62

**Indicates mean percentages significantly different from the nation at the .05 level.*

APPENDIX A

NATIONAL ASSESSMENT ESTIMATION OF STANDARD ERRORS

Several measures of achievement that National Assessment uses in its reports are described in Chapter 1. The sample design used by National Assessment is a complex, deeply stratified, multistage probability sample design. A reasonably good approximation of standard error estimates of these achievement measures can be obtained by applying the jackknife procedure to first-stage sampling units within strata, using the method of successive differences and accumulating across strata.

In this section the measures of achievement are first defined in algebraic form, followed by a description of the jackknife method used by National Assessment to estimate their standard errors.

Measures of Achievement

Based on the sample design, a weight is assigned to every individual who responds to an exercise administered in an assessment. The weight is the reciprocal of the probability of selecting a particular individual to take a particular exercise with adjustment for nonresponse. Since the probabilities of selection are based on an estimated number of people in the target age population, the weight for an individual estimates the number of similar people that the individual represents in the age population. The weights were adjusted to reflect information on population distributions from previous assessments.

A sum of the weights for all individuals at an age level responding to an exercise is an estimate of the total number of people in that age population. A sum of weights for all individuals at an age responding correctly to an exercise is an estimate of the number of people who would be able to respond correctly in the age population if the entire population were assessed. These concepts also apply to any reporting group (e.g., region, sex, etc.) and category of response (e.g., correct, incorrect and "I don't know").

Let w^{e}_{ihk} = the sum of weights for respondents to exercise e who are in reporting subgroup i and who are in the kth PSU of the hth sampling stratum and

c^{ej}_{ihk} = the sum of weights for respondents to exercise e who are in subgroup i, who are in the kth PSU of stratum h and who selected response category j (e.g., correct foil) for the exercise.

Note that $W^{e}_{ihk} = \sum_{j} C^{ej}_{ihk}$.

Then, summing k over the n_h sample PSUs in stratum h, and summing over the H sample strata, $W^{e}_{i++} = \sum_{h=1}^{H} \sum_{k=1}^{n_h} W^{e}_{ihk}$ estimates the number of eligibles in the population who are in subgroup i.

Similarly, $C^{ej}_{i++} = \sum_{h=1}^{H} \sum_{k=1}^{n_h} C^{ej}_{ihk}$ estimates the number of eligibles in the population who are in subgroup i and who would select response category j for exercise e.

An estimate of the proportion of the eligibles in the age population in group i who would select response category j on exercise e is:

(1) $P^{ej}_{i} = C^{ej}_{i++} / W^{e}_{i++}$.

In the special case where the proportion of all age eligibles who would select response category j on exercise e is estimated, the Index A (for ALL) will be used in place of i as follows:

(2) $P^{ej}_{A} = C^{ej}_{A++} / W^{e}_{A++}$.

In National Assessment reports, the proportion in (1) multiplied by 100 is called the group percentage, and the proportion in (2) multiplied by 100 is called the national percentage. The difference between the proportion in subgroup i who would select category j on exercise e and the proportion in the nation is denoted by:

(3) $\Delta P^{ej}_{i} = P^{ej}_{i} - P^{ej}_{A}$.

National Assessment also reports the arithmetic mean of the percentage of correct responses over sets of exercises corresponding to the measures in (1), (2) and (3). These means are taken over the set of all exercises or a subset of exercises classified by a reporting topic or content objective. The mean percentage of correct responses taken over m exercises in some set of exercises corresponding to measures (1), (2) and (3) are, respectively:

(4) $\overline{P}_{i} = \frac{1}{m} \sum_{e} C^{e}_{i++} / W^{e}_{i++}$,

(5) $\overline{P}_{A} = \frac{1}{m} \sum_{e} C^{e}_{A++} / W^{e}_{i++}$ and

(6) $\overline{\Delta P}_i = \overline{P}_i - \overline{P}_A$.

Note that the response category subscript j has been suppressed since the means are understood to be taken over the correct response category for each exercise.

Each of these six achievement measures are computed and routinely used in reports describing achievement data for any assessment. The simple difference in these measures between two assessments of the same exercise (or sets of exercises) provides six measures of change in achievement that are routinely used in National Assessment's change reports. The next section describes how standard errors are estimated for the 12 statistics routinely used in National Assessment reports.

Computation of Standard Errors

In order to obtain an approximate measure of the sampling variability in the statistics (1) through (6), a jackknife replication procedure for estimating the sampling variance of nonlinear statistics from complex, multistage samples was tailored to National Assessment's sample design. References (4), (5) and (7) provide information about the jackknife technique, while reference (3) describes how the procedure is used in estimating standard errors for National Assessment's sample designs.

To demonstrate the computational aspects of this technique, consider estimating the variance of the statistics in (1) -- the proportion of age eligibles in subgroup i who would select response category j on exercise e.

This statistic is based on data from all the n_h PSUs in the H strata. Let P^{ej}_{i-hk} be defined as a replication estimate of P^{ej}_i and constructed from all the PSUs, excluding the data from PSU k in stratum h. These replication estimates are computed as if the excluded PSU had not responded, and a reasonable nonresponse adjustment is used to replace the data in PSU hk in estimating P^{ej}_i. Several choices for replacing the data in PSU hk are available. In order to obtain a convenient and computationally efficient algorithm for approximating standard errors, National Assessment replaces C^{ej}_{ihk} and W^{e}_{ihk} from the hkth PSU with corresponding sums from another paired PSU in the same stratum. The replicate estimate is then computed. The replicate estimates to be used in the calculations are determined by arranging all of the PSUs in each stratum into successive pairs. That is, PSU 1 is paired with PSU 2, PSU 2 with PSU 3, 3 with 4, ... (n_h-1) with n_h and PSU n_h with PSU 1.

The contribution to the variance of P^{ej}_i by each pair of PSUs is the change in the value of the statistic incurred by replacing the data from each PSU in

the pair with the data from the other PSU in the pair and recomputing P_i^{ej} in the usual way. This produces two replicate estimates. Squaring the difference between these replicate estimates and then dividing by eight measures the contribution of this pair of PSUs to the total variance. The sum of these contributions over all n_h successive pairs in the stratum is the contribution by stratum h to the total variance. The square root of the sum of the H stratum contributions is the estimate of the standard error of P_i^{ej}.

Algebraically, the two replicate estimates for the pair k, $k+1$ (where $k=1, \ldots, n_h$ and $n_h+1=1$) are:

$$(7) \quad P_{i-hk}^{ej} = \frac{C_{i++}^{ej} - C_{ihk}^{ej} + C_{ih(k+1)}^{ej}}{W_{i++}^{ej} - W_{ihk}^{ej} + W_{ih(k+1)}^{ej}}$$

and

$$(8) \quad P_{i-h(k+1)}^{ej} = \frac{C_{i++}^{ej} - C_{ih(k+1)}^{ej} + C_{ihk}^{ej}}{W_{i++}^{ej} - W_{ih(k+1)}^{ej} + W_{ihk}^{ej}} .$$

The contribution to the total variance from stratum h is:

$$(9) \quad var\ (P_{ih}^{ej}) = \frac{1}{8} \sum_{k}^{n_h} \left(P_{i-hk}^{ej} - P_{i-h(k+1)}^{ej} \right)^2 .$$

And, finally, an estimate of the standard error of P_i^{ej} is:

$$(10) \quad SE\ (P_i^{ej}) = \left(\sum_{h}^{H} var\ P_{ih}^{ej} \right)^{\frac{1}{2}} .$$

Multiplying P_i^{ej} by 100 yields the percentage of response to category j. Multiplying $SE\ (P_i^{ej})$ by 100 yields the corresponding estimated standard error of the percentage.

In general, the jackknifed standard errors of the proportion estimates will be larger than the simple random sampling formula $(pq/n)^{\frac{1}{2}}$, where $p=p_i^{ej}$, $q=1-p$ and n is the number of sampled respondents in subgroup i who took the exercise. The larger size of $SE\ (P_i^{ej})$ reflects mainly the loss of precision due to cluster-sampling of schools and students.

The standard errors for the achievement measures (2) through (6) are computed through a series of steps analogous to those followed in computing $SE\ (P_i^{ej})$. The most complicated step in computing standard errors occurs in forming the paired replicate estimates analogous to (7) and (8) for each successive pair of PSUs. Once this bookkeeping chore is done, the computations for (9) and (10) follow in a straightforward manner.

The standard errors for the differences between two assessments for any of the achievement measures (1) through (6) are computed as the square root of the sum of the squared standard errors from each of the separate assessments.

The size of the standard errors depends largely on the number of PSUs and schools included in the sample, but also on the number of respondents in each of the reporting groups. Tables A-1 and A-2 show the average number of students responding to an exercise package for each of the reporting groups for each age and for each of the two mathematics assessments.

The size of the standard errors of the means of the achievement measures for sets of exercises is also influenced by the number of exercises in the exercise set and the number of packages over which the items in the set are spread.

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TABLE A-1. Average Number of Respondents in Reporting Groups Taking an Item Booklet, by Age and Assessment Year

	Age 9		Age 13		Age 17	
	1972-73	1977-78	1972-73	1977-78	1972-73	1977-78
Nation	2,663	2,456	2,612	2,424	2,351	2,230
Region						
Northeast	656	552	651	547	573	516
Southeast	669	591	667	546	596	509
Central	672	764	649	770	596	731
West	665	549	645	561	586	474
Sex						
Male	1,328	1,234	1,294	1,210	1,126	1,085
Female	1,335	1,221	1,318	1,214	1,225	1,145
Race						
White	1,997	1,848	1,977	1,862	1,852	1,796
Black	466	433	436	396	358	306
Parental education						
Not graduated high school	271	204	417	302	455	334
Graduated high school	564	579	792	797	720	763
Post high school	787	772	994	942	1,028	1,020
Type of community						
Extreme rural	265	240	263	242	230	221
Disadvantaged urban	266	245	264	241	239	214
Advantaged urban	267	247	260	243	234	227
Size of community						
Big cities	619	640	583	685	439	612
Fringes around big cities	515	524	531	519	493	483
Medium cities	372	170	365	170	326	126
Small places	1,157	1,122	1,133	1,049	1,094	1,008
Grade in school						
3, 7, 10	646	634	693	652	305	303
4, 8, 11	1,946	1,755	1,809	1,704	1,688	1,675
12	---	---	---	---	304	220

TABLE A-2. Average Number of Respondents in Selected Reporting Groups Taking an Item Booklet, by Age in 1977-78

	Age 9	Age 13	Age 17
Sex x race			
Black females	221	210	165
Black males	212	187	141
White females	915	922	910
White males	934	940	887
Grade x race/ethnicity			
Grade 3 blacks	108		
Grade 3 Hispanics	42		
Grade 3 whites	477	N/A*	N/A*
Grade 4 blacks	296		
Grade 4 Hispanics	90		
Grade 4 whites	1,339		
Race x type of community			
Black extreme rural	34	39	17
Black disadvantaged urban	155	151	118
Black advantaged urban	11	13	8
White extreme rural	185	182	187
White disadvantaged urban	63	62	62
White advantaged urban	228	218	213
Race/ethnicity x region			
Blacks in Northeast	120	98	94
Blacks in Central	77	78	43
Blacks in West	51	44	32
Blacks in Southeast	185	176	138
Hispanics in Northeast	33	23	18
Hispanics in Central	8	7	5
Hispanics in West	88	111	74
Hispanics in Southeast	6	3	4
Whites in Northeast	393	424	396
Whites in Central	673	679	677
Whites in West	385	394	358
Whites in Southeast	398	365	365
Use hand calculator			
Use calculator more than once/week		543	729
Use calculator less than once/week		421	401
Use calculator once/month		513	492
Never use calculator		723	479

*Not applicable.

TABLE A-2 *(Continued)*. Average Number of Respondents in Selected Reporting Groups Taking an Item Booklet, by Age in 1977-78

	Age 9	Age 13	Age 17
Hours watched TV yesterday			
Watched TV less than 1 hour			754
Watched TV 1 or 2 hours		N/A*	577
Watched TV 3 or 4 hours		N/A*	444
Watched TV 5 or more hours			179
Level of mathematics course work			
Took less than Algebra I			454
Took Algebra I		N/A*	343
Took Geometry		N/A*	316
Took Algebra II			498
Took more than Algebra II			245
Sex x level of mathematics course work			
Female took less than Algebra I			229
Female took Algebra I			196
Female took Geometry			173
Female took Algebra II		N/A*	261
Female took more than Algebra II		N/A*	105
Male took less than Algebra I			225
Male took Algebra I			147
Male took Geometry			143
Male took Algebra II			237
Male took more than Algebra II			140
Race x level of mathematics course work			
Black took less than Algebra I			91
Black took Algebra I			47
Black took Geometry			32
Black took Algebra II			55
Black took more than Algebra II		N/A*	18
White took less than Algebra I			328
White took Algebra I			280
White took Geometry			269
White took Algebra II			423
White took more than Algebra II			215

**Not applicable.*

APPENDIX B

SOURCE QUESTIONS FOR SPECIAL VARIABLES

In this appendix are copies of the exercises used to create the use of the hand calculator, the amount of television watched and the level of mathematics course work variables.

To obtain the levels of the use of the hand calculator, part B of Exhibits B-1 and B-2 were used. The level titled "Use Calculator More Than Once/Week" comes from students selecting the choices "almost daily" or "a few times a week." The other three categories are made up of those students who chose the responses with the names corresponding to the category titles (refer to Chapter 1 for definitions of the different levels). Those who did not respond or answered "I don't know" are categorized together and are not reported.

The categories for how much TV watched comes from the item displayed in Exhibit B-3. Those persons responding "none" or "one hour or less" were grouped into the category for less than one hour. Those responding "one hour" or "two hours" are in the category of one or two hours, similarly those choosing "three hours" or "four hours" and "five hours" or "six hours or more" went, respectively, into categories for three to four hours and five hours or more. Those not responding are not included in this report.

The levels for mathematics course work comes from the item shown in Exhibit B-4. The key point in classifying individuals using this item is the highest level of mathematics taken. Since we cannot determine the level of a computer programming course, this part was not used in defining this variable. The less-than-Algebra-I category is made up of those individuals who had indicated not taking one-half year or one year of any courses listed in parts C-G or I. The took-Algebra-I category is made up of those selecting one-half year or one year in part C but not selecting one-half year or one year in parts D-G or I. The took-Geometry category is made up of those who selected one-half year or one year for part E but did not select one-half year or one year for parts D, F, G or I. The took-Algebra-II category consists of those who selected one-half year or one year for part D and also selected one or more choices from parts F, G or I. A number of individuals did not fall into any category; their performance was similar to the national average and is not reported here.

EXHIBIT B-1. Source Question for 13-Year-Old
Hand Held Calculator Variable

For each of the following questions, fill in one oval in each box.

A. The metric system of measurement uses units like centimeters, liters, and kilograms. How often have you used the metric system?

Often ⬭ Seldom ⬭ Never ⬭ I don't know. ⬭

B. How often do you use a hand calculator?

Almost Daily ⬭ A few times a week ⬭ Less than once a week ⬭ Once a month ⬭ Never ⬭ I don't know. ⬭

C. Do you or your family own a hand calculator?

Yes ⬭ No ⬭ I don't know. ⬭

D. Does your school provide hand calculators for use in mathematics class?

Yes ⬭ No ⬭ I don't know. ⬭

EXHIBIT B-2. Source Question for 17-Year-Old
Hand Held Calculator Variable

For each of the following questions, fill in one oval in each box.

A. The metric system of measurement uses units like centimeters, liters, and kilograms. How often have you used the metric system of measurement?

Often ⬭ Seldom ⬭ Never ⬭ I don't know. ⬭

B. How often do you use a hand calculator?

Almost Daily ⬭ A few times a week ⬭ Less than once a week ⬭ Once a month ⬭ Never ⬭ I don't know. ⬭

C. Do you or your family own a hand calculator?

Yes ⬭ No ⬭ I don't know. ⬭

D. Does your school provide hand calculators for use in mathematics classes?

Yes ⬭ No ⬭ I don't know. ⬭

E. Does your school provide hand calculators for use in other classes?

Yes ⬭ No ⬭ I don't know. ⬭

EXHIBIT B-3. Source Question for 17-Year-Old
Watch TV Variable

How much television did you watch yesterday?

- ⬭ None
- ⬭ 1 hour or less
- ⬭ 1 hour
- ⬭ 2 hours
- ⬭ 3 hours
- ⬭ 4 hours
- ⬭ 5 hours
- ⬭ 6 hours or more

EXHIBIT B-4. Source Question for 17-Year-Old
Mathematics Course Work Variable

Which of the following mathematics courses have you studied? Fill in one oval on each line. (If you have not studied a particular course, fill in the oval under "Not Studied".)

		Studied 1 school year	Studied ½ school year	Studied less than ½ year	Not studied	I don't know.
A.	General, Business or Consumer Mathematics	⬭	⬭	⬭	⬭	⬭
B.	Introduction to Algebra (Pre-Algebra)	⬭	⬭	⬭	⬭	⬭
C.	1st year Algebra	⬭	⬭	⬭	⬭	⬭
D.	2nd year Algebra	⬭	⬭	⬭	⬭	⬭
E.	Geometry	⬭	⬭	⬭	⬭	⬭
F.	Trigonometry	⬭	⬭	⬭	⬭	⬭
G.	Probability & Statistics	⬭	⬭	⬭	⬭	⬭
H.	Computer Programming	⬭	⬭	⬭	⬭	⬭
I.	Pre-Calculus/ Calculus	⬭	⬭	⬭	⬭	⬭

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